# ***SB-2000 CURRENCY DISCRIMINATOR***

## *SERVICE MANUAL Vol 1.0*

AMROTEC®

This service manual covers the installation, disassembly and assembly, electrical, mechanical and software adjustment, and troubleshooting of SB-2000 Series Currency Discriminating Counter. We recommend reading this guide thoroughly before disassembling the Currency Discriminator. Then, as you become more familiar with SB-2000, use it as a reference guide to look up information when you need it.

### 1-2 FCC Compliance

**THIS DEVICE COMPLIES WITH PART 15 OF FCC RULES.**
**OPERATION IS SUBJECT TO THE FOLLOWING CONDITIONS:**

1. THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND
2. THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE

## FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates uses and can emit radio frequency energy and, if not installed and used in accordance with the instruction manual may cause harmful interference in radio communications. Operation of this equipment in a residence area is likely to cause harmful interference in which case the users will be required to correct the interference at their own expense.

# Important Safety Information

## Safety Precaution

Please read the safety precautions below before operating SB-2000. They must be observed to avoid any potential hazards that could result in personal injuries or damage to SB-2000 Currency Discriminator Counter.

**ELECTRICAL SAFETY!**

To avoid the risk of electrical shock, fire, or damage to SB-2000 Currency Counter

1. Do not remove machine covers or guards that require a tool for removal. There are no operator serviceable areas inside your machine. Contact your service personal for help.
2. Never defeats interlock switches. This machine is designed to restrict operator access to unsafe areas. Covers, guards and interlock switches are provided to ensure that the machine will not operate with covers opened.
3. Do not disassemble SB-2000 yourself.
4. Do not use damaged or worn power cords or plugs.
5. Keep metal objects, such as paper clips, away from the hopper and stacker. If an object does fall into the unit, turn off the power and unplug SB-2000 immediately. Contact an authorized SB-2000 service provider for assistance.
6. Keep liquids away from SB-2000. Do not operate the Currency Counter if it is wet. Also, do not touch the Currency Counter if you are wet. If a spill occurs, turn off the power and unplug SB-2000 immediately. Contact an authorized SB-2000 service provider for help.

**SAFETY INSTRUCTIONS!**

The SB-2000 Currency Counter automatically starts operating in certain circumstances. Consequently, it is important to always follow these precautions:

1. Do not wear loose clothing or jewelry while operating the Currency Counter.
2. Make sure that your hair does not touch the Currency Counter.
3. Do not touch currency that has been placed in the stacker while the motor is running.

4. Turn off the power before performing any maintenance or error corrections that require you to put your hands into the machine.
5. Do not allow anything to rest on the power cord, line cord, or PC interface cable.
6. Do not install your machine near walking area ensuring that power plug of the machine does not get unplugged during operation.
7. Use supplies or cleaning materials only as directed. Keep all supplies and cleaning materials out of the way of children.
8. Your machine and the supplies are designed and tested to meet strict safety requirements. Included are safety agency examination and approval and compliance to establish environmental standards.

**Warning**

Hazardous moving parts!

Keep fingers and other body parts away

## *CAUTION*

- Keep drinks, food, and other foreign objects away from the Currency Counter.
- Placing foreign objects on or into the Currency Counter can interrupt operation of the machine.

## Installation and Handling of the machine

### Unpacking

After unpacking the SB-2000 Currency Discriminator Counter, store the box and packing materials for future shipping. Failure to ship the Currency Counter in the original box and packaging will void the warranty.

### Installation

1. Select an appropriate workspace. Make sure that the work surface is flat and level, away from any heating device, such as a radiator, away from bright sunlight, and as free of dust, dirt, and smoke as possible. This will ensure proper operation and prevent damage to the rubber components of the machine.
2. Operate on only the following power sources: 120VAC/60Hz, (USA and North America).
3. Connect the power cord to the back of the Currency Counter.
4. Plug the cord into the wall outlet.
5. When replacing fuses, use only the same type and rating. Using a higher rated fuse can create a fire hazard.

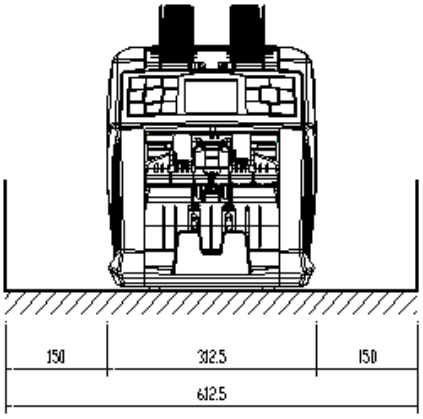
**Use the product in the following temperature and humidity range.**

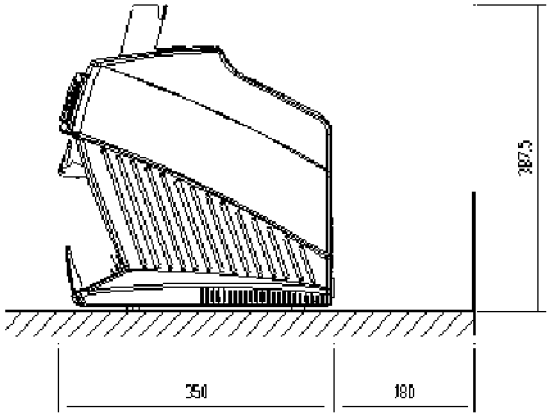
a. Temperature 0-35º (32-95F)

b. Humidity 20-90% (without dew condensation)

## ※ Installation Spacing Requirement ※

- Allow sufficient space from peripheral walls and the product as shown on the following Figure.
- Allow sufficient operation space for inserting and removal of banknotes, opening and closing of doors and covers and also allow space necessary for maintenance.



# 1. Description of Parts (Exterior and Interior)

## 1.1. Drawing

### 1.1.1. Front view

### 1.1.2. Rear view

### 1.1.3. Left side view

### 1.1.4. Right side view

### 1.1.5. Aslant view

## 1.2 Structure, name and description of the parts

### 1.2.1 Side of Perspective drawing

### 1.2.3. Hopper Part

### 1.2.4. Display Part

### 1.2.5. Pocket Part

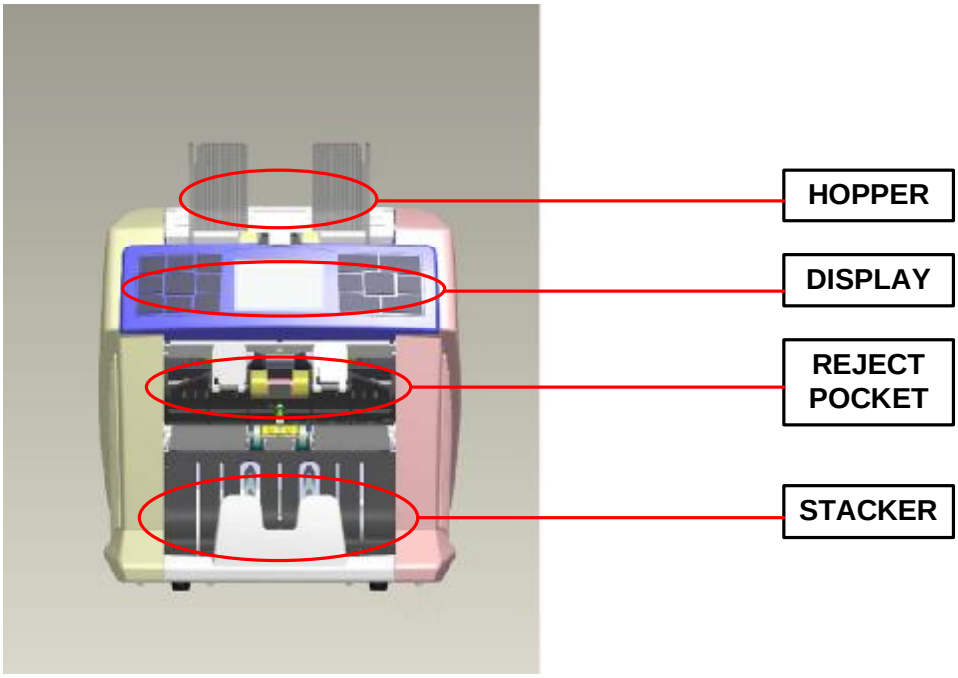
### 1.2.6. Discrimination Part

### 1.2.7. Transfer Plate Part

### 1.2.8. Base Framework Part

## 1.1. Drawing

### 1.1.1. Front view




**<Front View>**

**<Figure 1.1>**

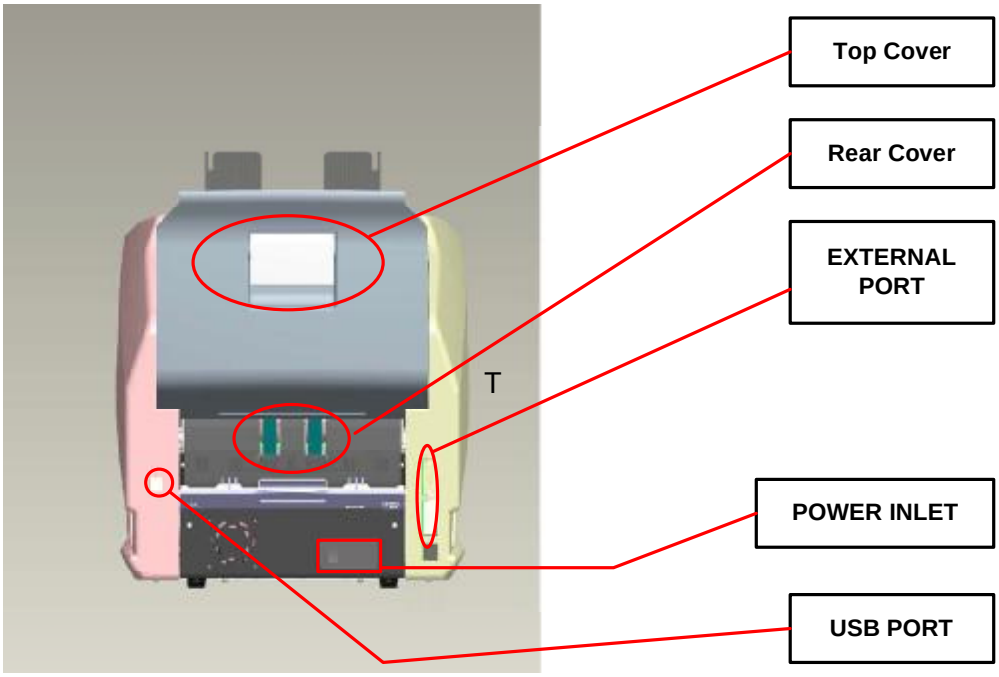
- **Hopper:** Hopper is where user places a stack of banknotes to be counted.

- **Display:** This part includes of a graphic LCD display where current counting results, machine status and parameter are displayed.

- **Reject pocket:** Reject pocket is where counterfeit or misrecognition banknotes are transported. Reject pocket is also used during Facing and Orientation modes.

- **Stacker:** Stacker is a part where counted and denominated banknotes are stacked.

### 1.1.2. Rear view




**<Rear View>**

<Figure 1.2>

① **Top Cover:** This is the cover for recognition Module (CIS sensor) and counterfeit detectors, such as Magnetic, UV etc.

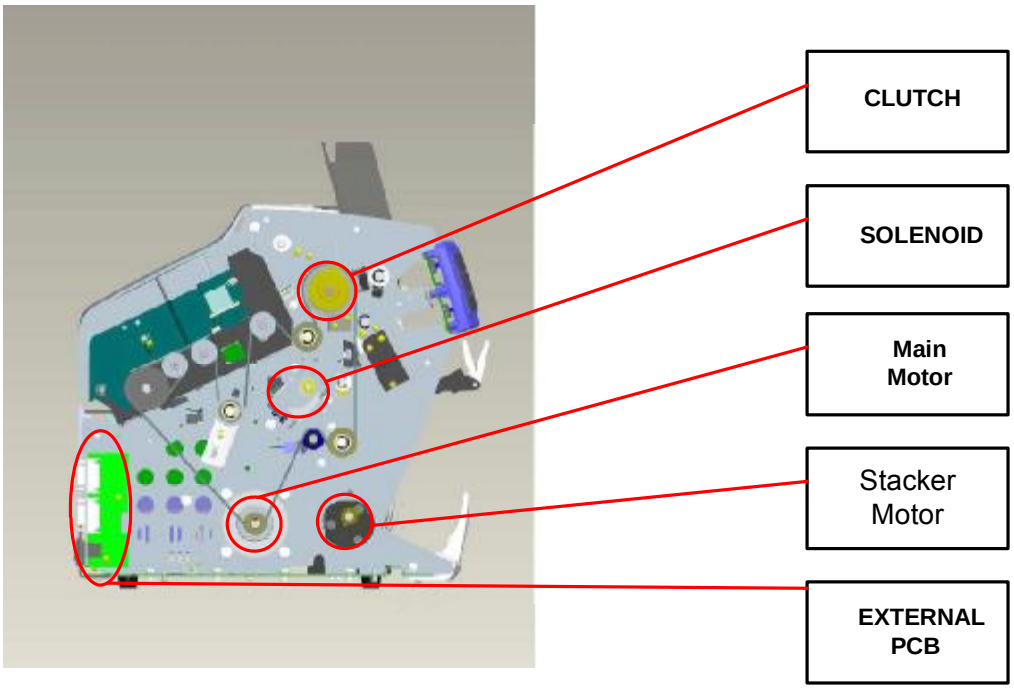
② **Rear Cover:** This is the cover for banknote transport mechanism.

③ **External port:** This is the Port (interface) to connect cable with external peripherals, such as printer or PC.

④ **Power inlet:** This is where you can connect A/C power cable to the machine. There is also a power switch labeled as ( I ) =ON and ( O ) = OFF.

⑤ **USB Port:** This Port can connect SB-2000 via a USB cable to various USB devices during software upgrade of SB-2000.

### 1.1.3. Left side view




**<Left Side View >**

<Figure 1.3>

① **Main motor:** This motor supplies electrical power to SB-2000.

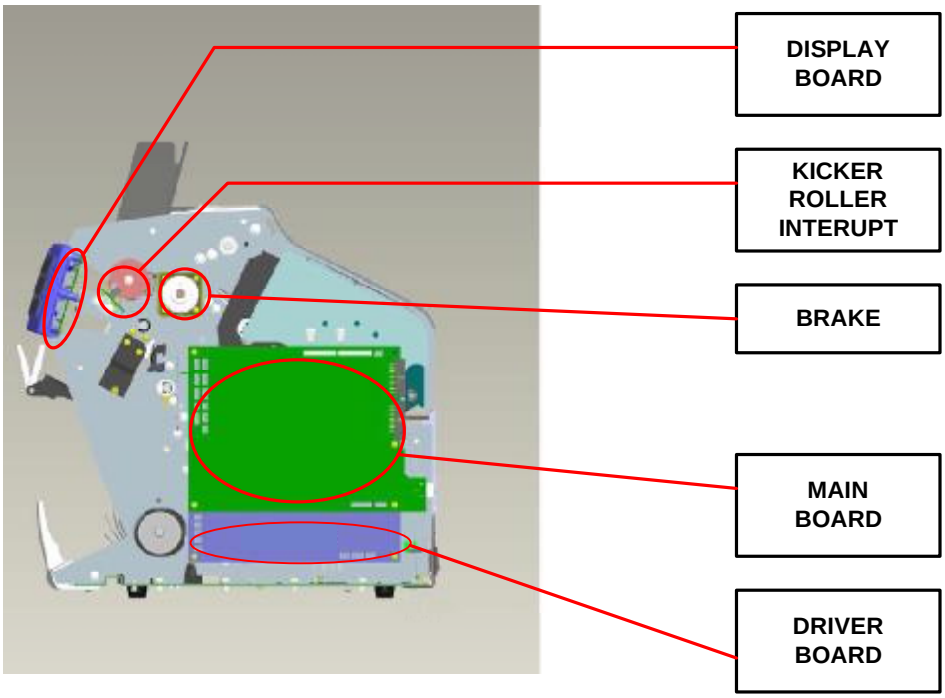
② **Solenoid:** This part controls separator to divert banknotes to main stacker or reject pocket.

③ **Clutch:** This part is responsible to supply power to banknote feeder.

④ **Stacker motor:** This part is to supply power to stacker motor responsible for neatly stacking bills to the Stacker without causing double error.

⑤ **External PCB:** This PCB is responsible to communicate with external devices.

### 1.1.4. Right side view




**<Right Side View>**

<Figure 1.4>

① **Display board:** This part includes LCD display and control panel of SB-2000.

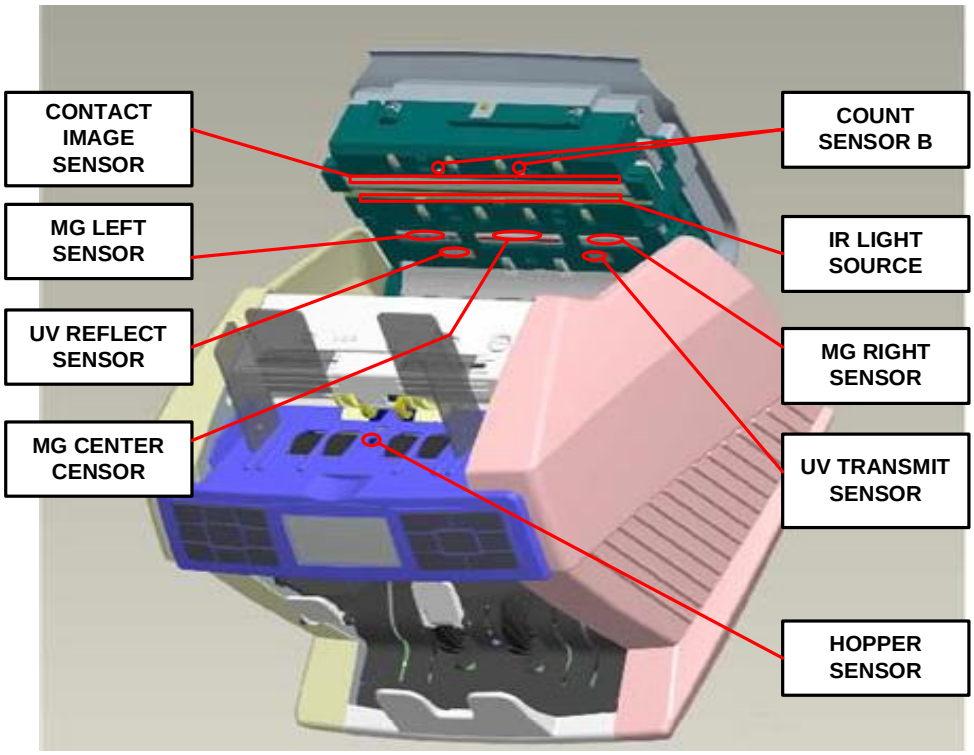
② **Kicker Roller interrupts:** This PCB is to detect position of KICKER Roller on feeder.

③ **Brake:** This part is responsible for blocking / interrupting power to feeder.

④ **Main board:** This PCB controls the entire operation of the SB-2000 machine

⑤ **Driver board:** This PCB controls Actuator.

### 1.1.5. Aslant view




<Figure 1.5>

① **Contact image sensor**: This sensor captures 2 dimensional images of banknotes.

② **MG left sensor:** This is left magnetic sensor to detect magnetic properties (available with SB-2000CF/F model)

③ **UV reflects sensor:** This sensor is to detect amount of UV on a banknote surface.

④ **MG center sensor**: This is an MR (Magneto resistive) sensor located at the center to detect certain magnetic properties on the surface of passing banknotes.

⑤ **Count sensor:** This sensor is to detect passing banknote and count numbers.

⑥ **IR light source:** This IR light source is to detect IR properties on passing banknotes. Only available with SB-2000CF and F model.

⑦ **MG right sensor:** This is right MG sensor to detect magnetic properties on passing banknotes (available with SB-2000CF /F model).

⑧ **UV transmit sensor module:** This is module to detect amount of fluorescence transmission in banknote.

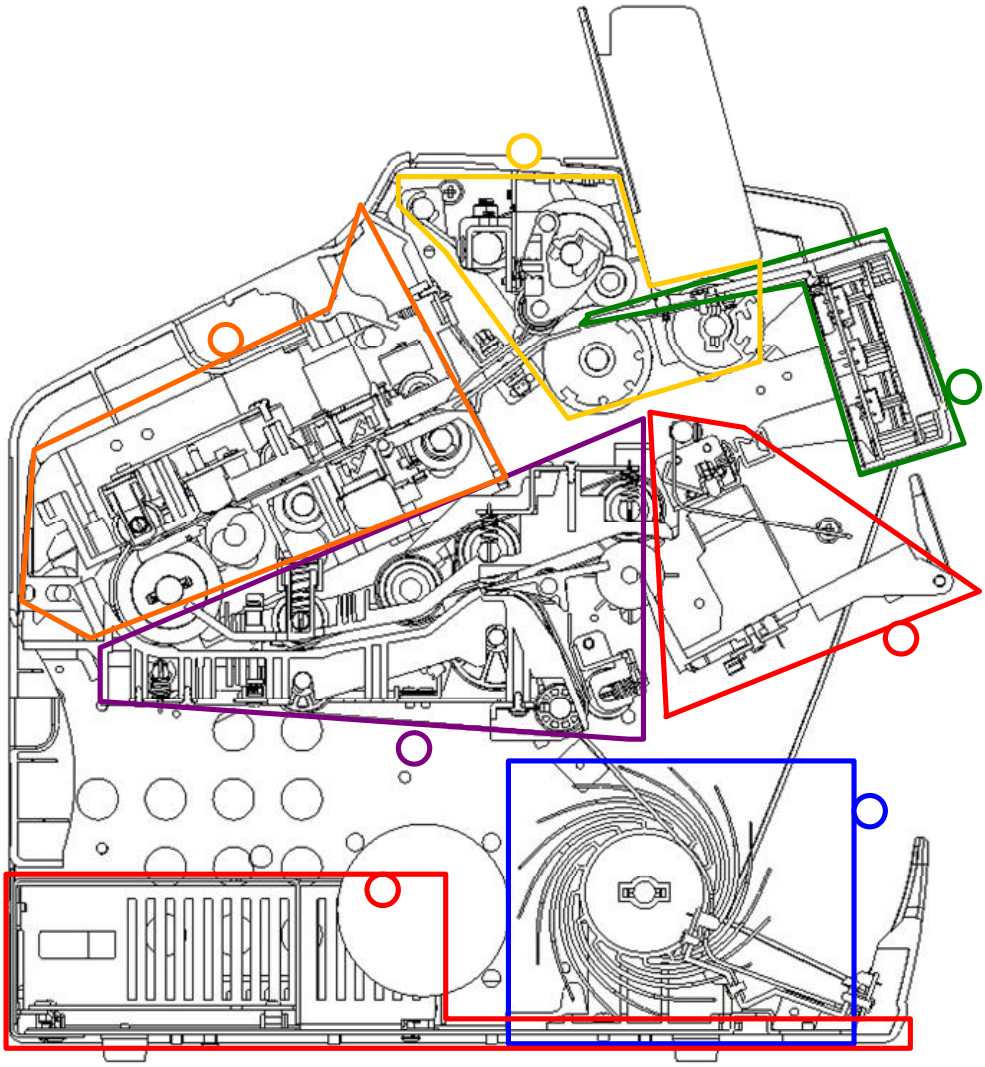
⑨ **Hopper sensor:** This is sensor to detect presence of banknote on feeder.

## 1.2 SB-2000 main body structure and assembly parts

| | |
|---|---|
| **Cover Part (Main Body)** | **Hopper Cover** |
| | **Top Cover** |
| | **Rear Cover** |
| | **Side Cover- Right** |
| | **Side Cover- Left** |
| | **Stacker Cover** |
| | **Rear Bottom Cover** |
| **Hopper Part** | |
| **Display Part** | |
| **Pocket Part** | **Pocket Stacker** |
| | **Stacker** |
| **CIS Ass'y** | **GCT Ass'y** |
| | **GCL Ass'y** |
| **Transfer Plate Part** | **GGT Ass'y** |
| | **GGL Ass'y** |
| **Base Framework Part** | **Side Framework** |
| | **Bottom Framework** |

SB-2000 is divided into 7 main body parts and sub-divided into 17 lower parts and modules. Each of these lower parts and modules are composed of different ass'y. For information about Partition, please refer to 2.1 Part List or 3.1.1. SB-2000 Partition.

### 1.2.1 Side of Perspective drawing



① **Hopper Part**

② **Display Part**

③ **Pocket Part –Pocket Stacker**

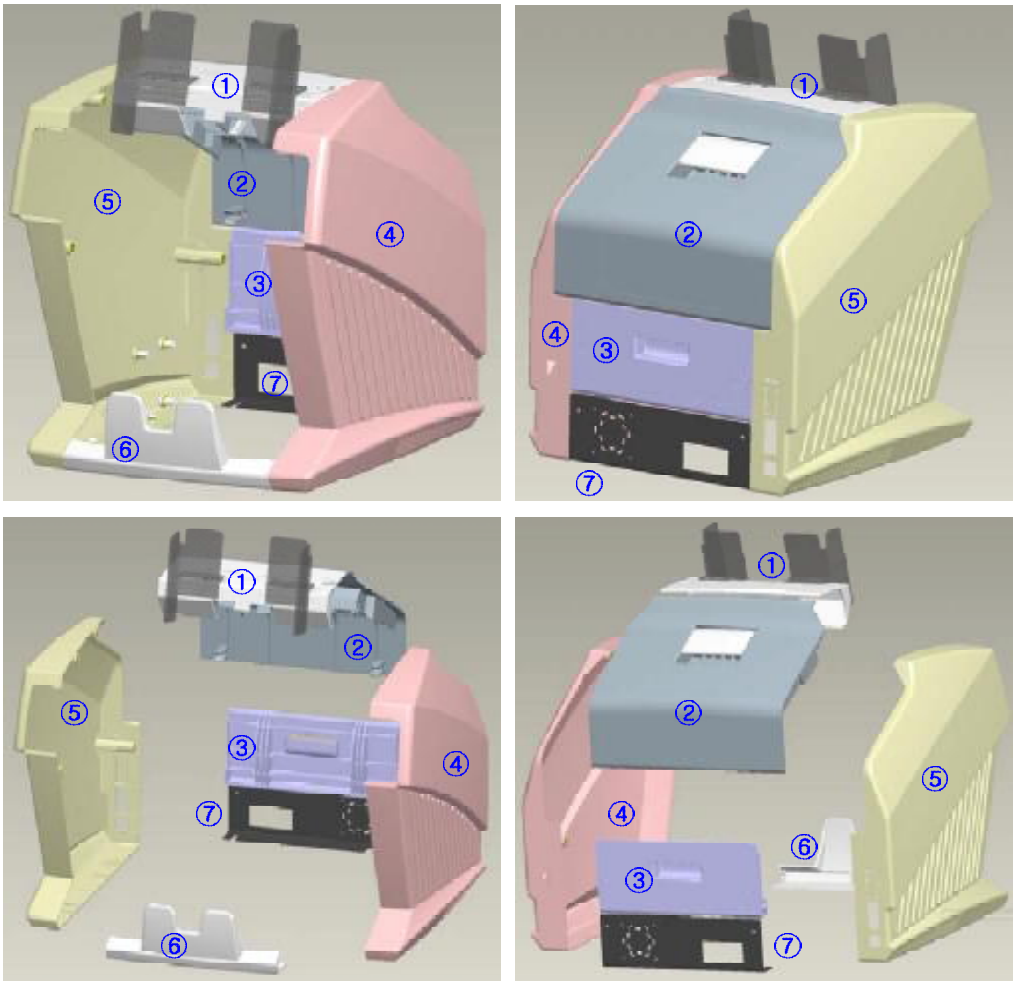
④ **Pocket Part – Stacker**

⑤ **CIS Ass'y – GCL Ass'y, GCT Ass'y**

⑥ **Transfer Plate Part – GGT Ass'y, GGL Ass'y**

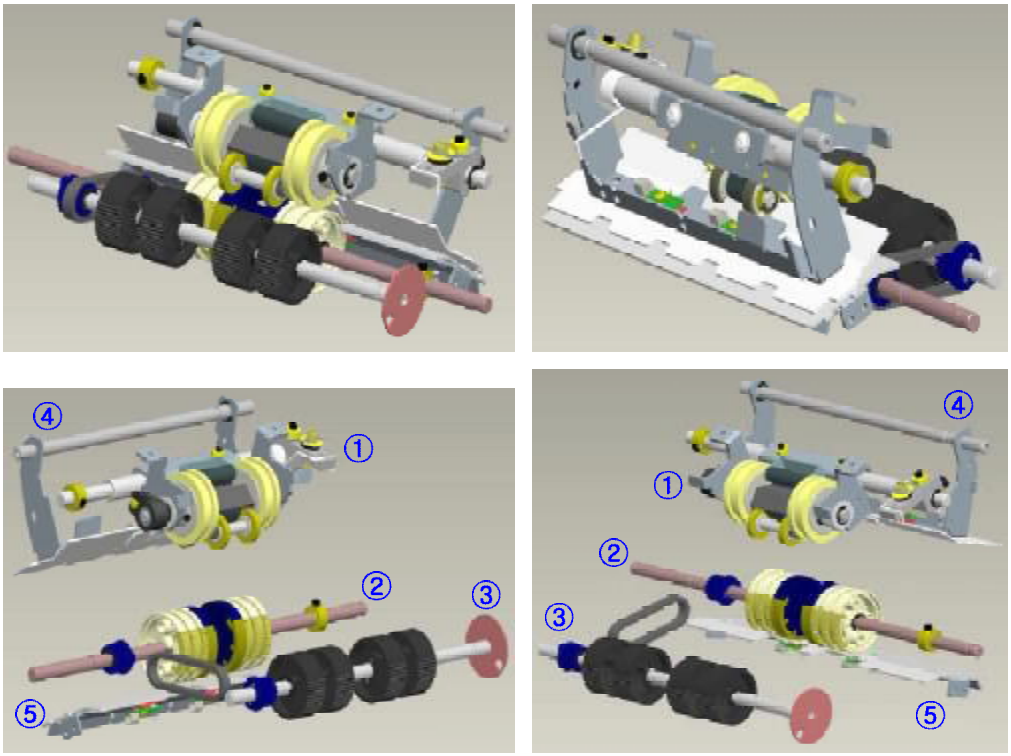
⑦ **Base Framework Part – Bottom Framework**

### 1.2.2. Cover Part (Body Parts)



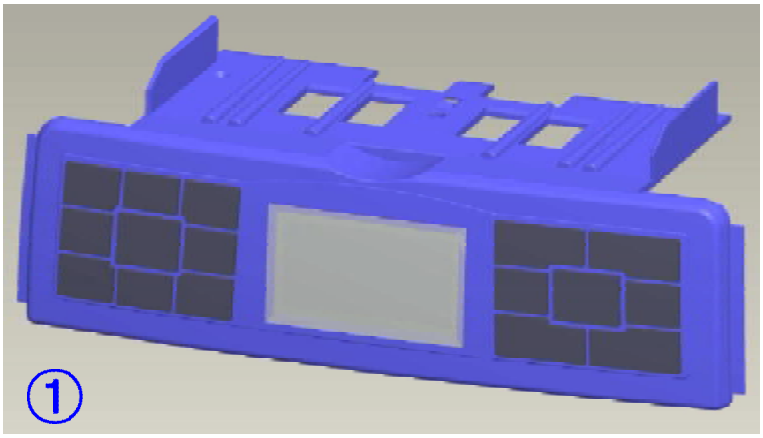

| Break-Down of Cover (Body) Parts | |
|---|---|
| ① | Hopper Cover |
| ② | Top Cover |
| ③ | Rear Cover |
| ④ | Side Cover- Right |
| ⑤ | Side Cover- Left |
| ⑥ | Stacker Cover |
| ⑦ | Rear Bottom Cover |

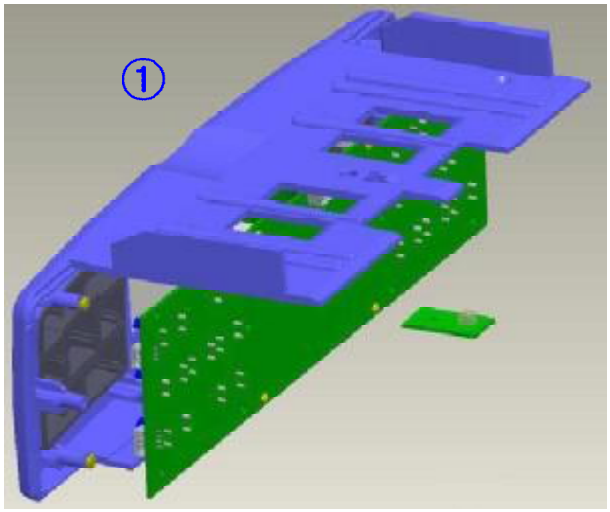
### 1.2.3. Hopper Part




| Break-down of Hopper Part | |
|---|---|
| ① | Thickness Ass'y |
| ② | Feed Roller Ass'y |
| ③ | Kicker Roller Ass'y |
| ④ | GST Ass'y |
| ⑤ | GSL Ass'y |

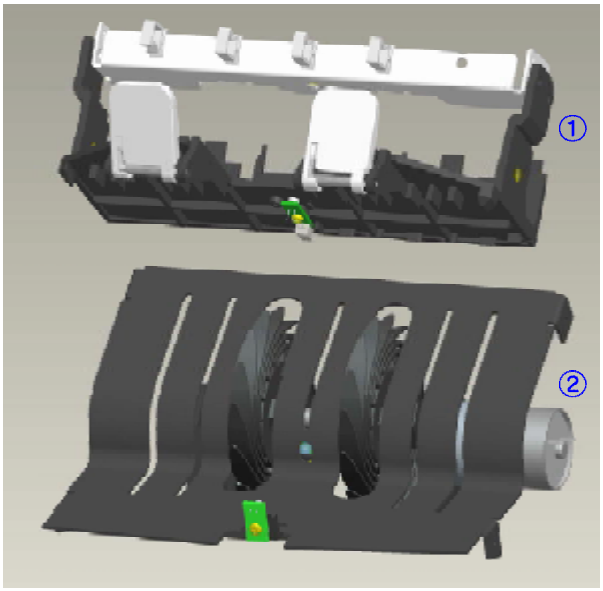
### 1.2.4. Display Part

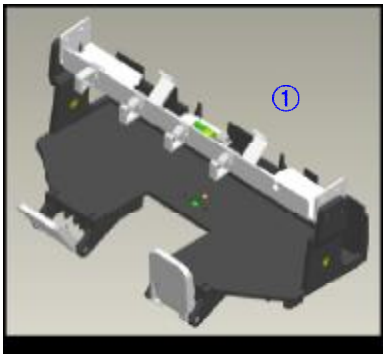


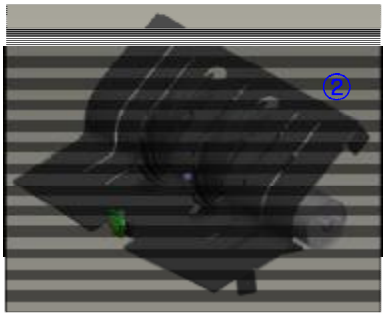




| Break-down of Display Part | |
|---|---|
| ① | Function Cover Ass'y |

### 1.2.5. Pocket Part

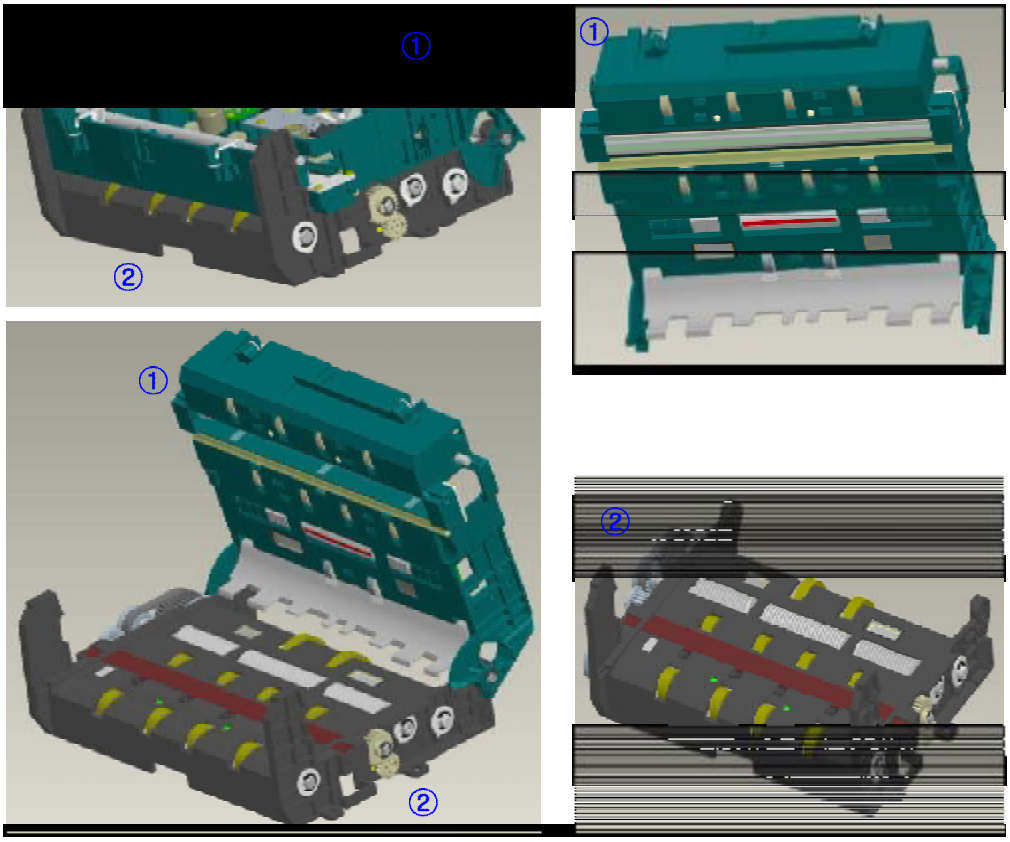


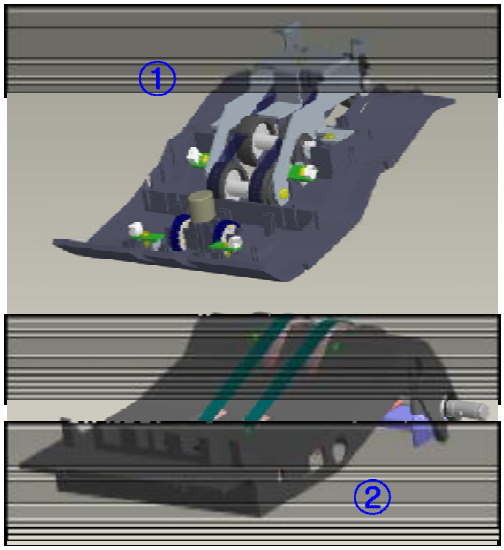

| Break-down of Pocket Part | |
|---|---|
| ① | Pocket Stacker Part |
| ② | Stacker Part |

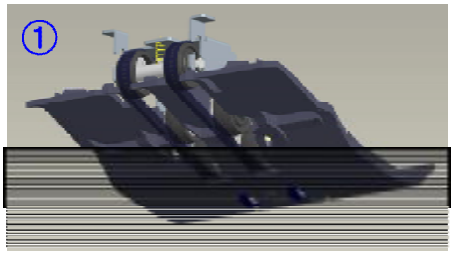
### 1.2.6. Discrimination Part

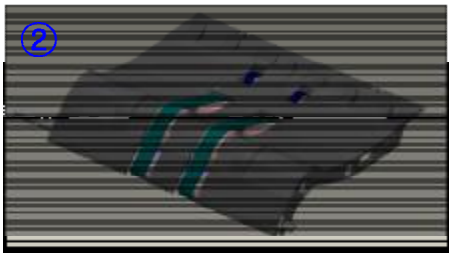



| Break-down of Discrimination Part | |
|---|---|
| ① | GCT Ass'y |
| ② | GCL Ass'y |

### 1.2.7. Transfer Plate Part

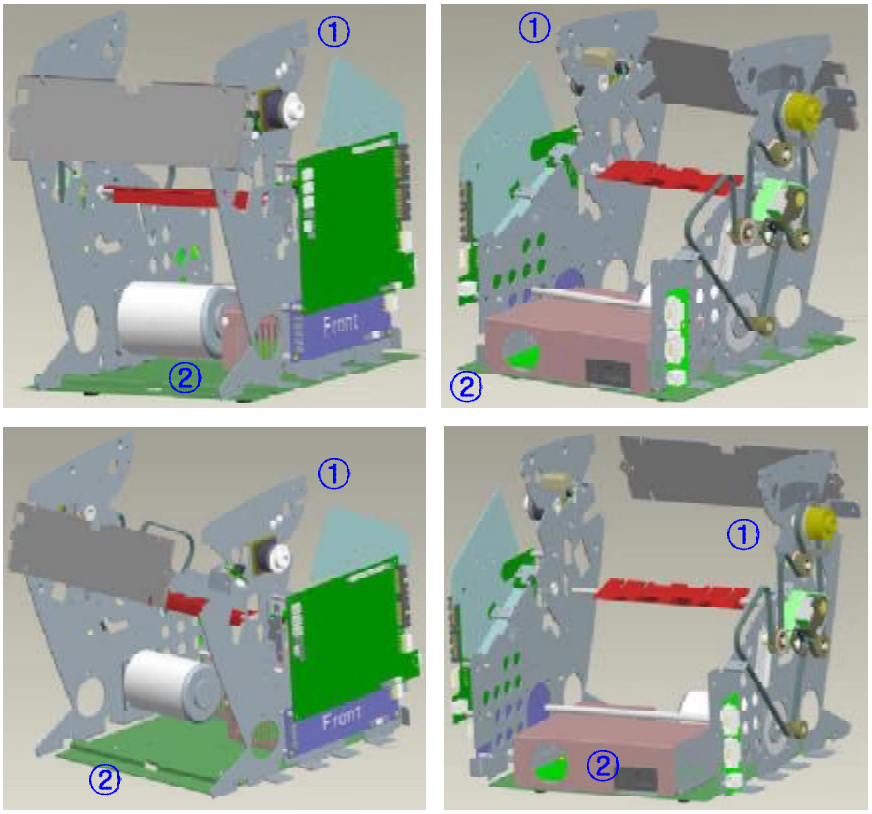


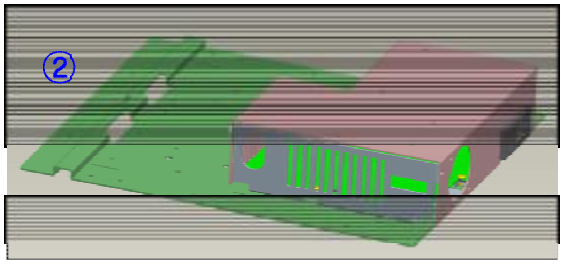




| Break-down of Transfer Plate Part | |
|---|---|
| ① | GGT Ass'y |
| ② | GGL Ass'y |

### 1.2.8. Base Framework Part




| Break-down of Base Framework Part | |
|---|---|
| ① | Side Framework Part |
| ② | Bottom Framework Part |

# 2. Part List

**This section is to introduce each parts of SB-2000.**
**This section is composed of Mechanical and Electronic Parts List.**
**Mechanic Part List is broken-down with each Part according to Partition.**
**Electronic Part List is broken-down with PCB, Sensor and Actuator.**

## 2.1 Mechanical Parts List

## 2.2. Electronic Parts List

## 2.1. Mechanical Part List

**Mechanical Part List's break-down**

| | |
|---|---|
| **Mechanical Part List** | **Cover Part List** |
| | **Hopper Part List** |
| | **Display Part List** |
| | **Pocket Part List** |
| | **Discrimination Part List** |
| | **Transfer Plate Part List** |
| | **Base Framework Part List** |

**Mechanical Part List**

**2.1.1. Cover Part List**

**2.1.2. Hopper Part List**

**2.1.3. Display Part List**

**2.1.4. Pocket Part List**

**2.1.5. Discrimination Part List**

**2.1.6. Transfer Plate Part List**

**2.1.7 Base Framework Part List**

### 2.1.1. Cover Part List

| Part 2 or Module | Ass'y 1 |
|---|---|
| PTM 4X6 | |
| Hopper Cover Ass'y | Hopper cover body |
| | L-Guide |
| | R-Guide |
| | PST1 3X8 P7 |
| | PST1 2.6X5 |
| | WASHER 3X6X0.5t |
| | Hopper Gear-A |
| | Hopper Gear-B |
| FMS 4X6 | |
| PTM 4X6 | |
| Left Side Cover | |
| FMS 4X6 | |
| PTM 4X6 | |
| Right Side Cover | |
| PST1 3X10 P7 | |
| Top Cover Ass'y | Top Cover |
| | Hand Cover |
| | Hand Cover Spring |
| FMS 4X6 | |
| Stacker Cover | |
| Rear Cover | |
| FMS 4X6 | |
| Rear Bottom Cover | |

### 2.1.2. Hopper Part List

| Part 2 or Module | Ass'y 1 | Ass'y 2 | Ass'y 3 |
|---|---|---|---|
| Thickness Ass'y | Shaft Stopper | | |
| | E-ring D6 | | |
| | BEARING F688ZZ (F1680) | | |
| | SEMS M4X12 P8 | | |
| | Reverse Ass'y | Clutch Arm Ass'y | |
| | | PMS M3X16 | |
| | | Holder | |
| | | E-ring D6 | |
| | | BEARING F688 (F1680) | |
| | | Reverse Shaft | |
| | | Reverse Roller | |
| | | Reverse Bracket | |
| | | Insert Ass'y | Insert Arm |
| | | | Insert Shaft |
| | | | Insert Roller |
| | | Pinch Ass'y | Pinch Arm |
| | | | Pinch Roller |
| | | | Pinch Bracket |
| | | | Pinch Shaft |
| | | | E-ring D5 |
| | | | Pinch Arm Shaft |
| | | | MG Presser Spring |
| | PMS M3X16 | | |
| | Thickness Stopper Ass'y | Thickness Stopper | |
| | | QM 5X14 | |
| | | SPRING PLATE | |
| | | RUBBER RING | |
| | | WASHER 14X6X0.8t | |
| | | ADJUST SCREW | |
| | | NUT 5 | |
| | | TORSHION SPRING | |
| | | SH 5X8 | |
| SEMS M3X8 P8 | | | |
| KICK DISK | | | |
| E-ring D6 | | | |
| BEARING F688ZZ(F1680) | | | |

| Part 2 or Module | Ass'y 1 | Ass'y 2 | Ass'y 3 |
|---|---|---|---|
| Kicker Roller Ass'y | Kick Pulley | | |
| | S/P PIN 3X12 | | |
| | E RING D6 | | |
| | Kick Shaft | | |
| | S/P PIN 3X15 | | |
| | Kick Roller Ass'y | Kick Core | |
| | | Kick Rubber | |
| Shaft Stopper | | | |
| E RING D6 | | | |
| BEARING F688 (F1680) | | | |
| Feed Roller Ass'y | E RING D6 | | |
| | S/P PIN 3X12 | | |
| | Kick Pulley | | |
| | E RING D6 | | |
| | S/P PIN 3X15 | | |
| | Feed Shaft | | |
| | Feed Roller Ass'y | Center Roller Ass'y | Center Boss |
| | | | Center Rubber |
| | | Feed Roller Ass'y | Feed Boss |
| | | | Feed Rubber |
| SEMS M4X8 P10 | | | |
| GST Ass'y | GST Spring | | |
| | E RING D6 | | |
| | GST Shaft | | |
| | GST Bracket | | |
| | PMS M3X8(Plastic) | | |
| | POLY WASHER 4X8X0.5t | | |
| | Sensor Support | | |
| | LED Sensor Ass'y | | |
| SEMS M3X6 P6 | | | |
| GSL Ass'y | PMS M3X8(Plastic) | | |
| | POLY WASHER 4X8X0.5t | | |
| | Sensor Support | | |
| | TR Sensor Ass'y | | |
| | GSL Bracket | | |
| | | | |

### 2.1.3. Display Part List

| Part 2 or Module | Ass'y 1 |
|---|---|
| FMS 3X6 | |
| Function Cover Ass'y | |
| Button | |
| Hopper Sensor Ass'y | |
| FMS 3X6 | |
| NUT 3 | |
| PST1 3X8 | |
| Display Ass'y | LCD Ass'y |
| | PCB SUPPORT 3X13 |
| | PMS M3X4 |
| | NUT 3 |
| | Display Board |

### 2.1.4. Pocket Part List

| Part 2 or Module | Ass'y 1 | Ass'y 2 | Ass'y 3 |
|---|---|---|---|
| Pocket Stacker Part | SEMS M3X6 P6 | | |
| | Pocket Body Ass'y | Pocket Body | |
| | | Sensor Support | |
| | | PMS M3X7 | |
| | | Reject Sensor LED | |
| | | TR Sensor Ass'y | |
| | | REC Sensor Ass'y | |
| | | REF Sensor Bracket | |
| | SEMS M3X8 P8 | | |
| | Pocket Stacker Ass'y | Pocket Stacker | |
| | | Pocket Shaft | |
| | | Pocket Spring | |
| | | Pocket Cover | |
| | | REF Plate | |
| | Pocket Roller Ass'y | Pocket Roller | |
| | | Pocket wheel Ass'y | |
| | Transfer Guide Ass'y | Transfer Bracket Guide | |
| | | SEMS M3X6 P6 | |
| | | Transfer Bracket | |
| | | Transfer Shaft | |
| | | Transfer Spring | |
| | | E RING D5 | |
| | | WASHER 10X6X0.5t | |
| | | Bearing 626ZZ | |
| Stacker Part | Stacker Guide Ass'y | Stacker Guide | |
| | | SEMS M3X8 P8 | |
| | | Stacker Sensor Ass'y | |
| | Stacker Wheel Ass'y | Stacker Wheel Arm | |
| | | E RING D6 | |
| | | Oilless Bearing F1580 | |
| | | Stacker Wheel Ass'y | Stacker Shaft |
| | | | S/P PIN 3X15 |
| | | | E RING D6 |
| | | | Stacker Wheel |
| | | Joint Wheel | |
| | | PMS M3X6 | |
| | | Stacker Motor | |

### 2.1.5 Transfer Plate Part List

| Part 2 or Module | Ass'y 1 | Ass'y 2 | Ass'y 3 |
|---|---|---|---|
| GGT Ass'y | GGT Body | | |
| | PST1 2.6X6 | | |
| | LED 5mm Sensor Ass'y | | |
| | Spring Cap | | |
| | GGT Spring | | |
| | GGT Roller | | |
| | GGT Shaft | | |
| | GGT Idle Bracket Ass'y | GGT Idle Bracket | |
| | | LED 5mm Sensor Ass'y | |
| | | PMS M3X4 | |
| | | GGT Idle Shaft-A Ass'y | GGT Idle Roller-A |
| | | | GGT Idle Shaft-A |
| | | | E RING D4 |
| | | GGT Idle Spring | |
| | | GGT Idle Shaft-B Ass'y | GGT Idle Roller-B |
| | | | GGT Idle Shaft-B |
| | | | E RING D4 |
| | | SEMS M3X6 P6 | |
| | | SE-N-SMVI 240x12x0.6 | |
| GGL Ass'y | GGL Guide | | |
| | PST1 3.5X10 | | |
| | GGT Bracket-C | | |
| | GGT Spring | | |
| | GGT Roller-C | | |
| | GGT Shaft-C | | |
| | PST1 2.6X6 | | |
| | TR Sensor Ass'y | | |
| | PST1 4X12 | | |
| | | | |

| Part 2 or Module | Ass'y 1 | Ass'y 2 | Ass'y 3 |
|---|---|---|---|
| GGL Ass'y | GGL Idle Ass'y | PMS M3X4 | |
| | | TR 5mm Sensor Ass'y | |
| | | E RING D6 | |
| | | DU0808 | |
| | | GGL Shaft-A Ass'y | BEARING F678ZZ (F1280) |
| | | | E RING D6 |
| | | | GGL Roller-A |
| | | | S/P PIN 3X12 |
| | | | GGL Shaft-A |
| | | GGL Shaft-B Ass'y | BEARING F686ZZ (F1360) |
| | | | E RING D5 |
| | | | GGL Roller-B |
| | | | S/P PIN 3X12 |
| | | | GGL Shaft-B |
| | | GGL Shaft-C Ass'y | BEARING F686ZZ (F1360) |
| | | | E RING D5 |
| | | | GGL Roller-C |
| | | | S/P PIN 3X12 |
| | | | GGL Shaft-B |
| | | SE-N-SMVI 271x12x0.6 | |
| | | Lower Transfer Idle Bracket | SEMS M3X6 P6 |
| | | | GGL Bracket-A |
| | | | GGL Bracket-B |
| | | | Sensor Bracket-L |
| | | | Sensor Bracket-R |
| | | | PMS M3X4 |
| | | | TR 5mm Sensor Ass'y |

### 2.1.6. Discrimination Part List

| Part 2 or Module | Ass'y 1 | Ass'y 2 | Ass'y 3 |
|---|---|---|---|
| Rotation Shaft | | | |
| E RING D5 | | | |
| GCT Ass'y | GCT Body | | |
| | PST1 3X8 | | |
| | GCT Board | | |
| | Magnetic | | |
| | Magnetic Bracket | | |
| | PST1 3X8 | | |
| | MG Ass'y | | |
| | MG Presser Spring | | |
| | PST1 3X8 | | |
| | WASHER 3X6X0.5t | | |
| | Reflection UV Sensor Ass'y | Reflection UV Board | |
| | | Reflection UV Housing | |
| | | Reflection UV Glass Ass'y | |
| | | Reflection UV Filter-A | |
| | | Reflection UV Filter-B | |
| | PST1 3X8 | | |
| | MR PCB-L | | |
| | PST1 3X8 | | |
| | MR PCB-R | | |
| | PST1 2x4 | | |
| | Trans UV Sensor PCB Ass'y | | |
| | Trans UV Filter | | |
| | PST1 2.6X6 | | |
| | CIS LED PCB | | |
| | PST1 2.6X6 | | |
| | CIS Lock Plate | | |
| | Reflection CIS | | |
| | GCT Lock Spring | | |
| | E RING D6 | | |
| | WASHER 14X6X0.8t | | |
| | Spring Cap | | |
| | GCT Shaft-A Ass'y | Bearing 625ZZ | |
| | | GCT Shaft-A | |
| | | GCT Spring | |
| | Spring Cap | | |

| Part 2 or Module | Ass'y 1 | Ass'y 2 | Ass'y 3 |
|---|---|---|---|
| GCT Ass'y | GCT Shaft-B Ass'y | GCT Roller-B | |
| | | GCT Shaft-B | |
| | | GCT Spring | |
| | PST1 2.6X6 | | |
| | LED Sensor Ass'y | | |
| | PST1 3X8 | | |
| | GCT Guide | | |
| | Trans UV Glass Ass'y | | |
| | CIS LED Acryl Ass'y | | |
| GCL Ass'y | GCL Body | | |
| | PST1 3X8 | | |
| | GCL Board | | |
| | PST1 3X8 | | |
| | WASHER 3X6X0.5t | | |
| | Reflection UV Sensor Ass'y | Reflection UV Board | |
| | | Reflection UV Housing | |
| | | Reflection UV Glass Ass'y | |
| | | Reflection UV Filter-A | |
| | | Reflection UV Filter-B | |
| | PST1 2x4 | | |
| | Trans UV Sensor PCB Ass'y | | |
| | Trans UV Filter | | |
| | Belt 153P3M6 | | |
| | DB Pulley | | |
| | E RING D6 | | |
| | BEARING F688 (F1680) | | |
| | GCL SHAFT-A Ass'y | GCL Roller-D | |
| | | GCL Shaft-D | |
| | GCL Pulley | | |
| | E RING D6 | | |
| | BEARING F688 (F1680) | | |
| | Brush Shaft Ass'y | | |
| | PST1 3X8 | | |
| | Trans CIS | | |
| | Trans CIS Locker-A | | |

| Part 2 or Module | Ass'y 1 | Ass'y 2 | Ass'y 3 |
|---|---|---|---|
| GCL Ass'y | Dummy CIS | | |
| | Dummy CIS Locker-B | | |
| | PST1 2.6x8 | | |
| | TR 5mm Sensor Ass'y | | |
| | Encorder Gear | | |
| | PMS M2X6 | | |
| | Encoder | | |
| | E RING D5 | | |
| | GCL Gear | | |
| | BEARING F686ZZ (F1360) | | |
| | GCL Pulley | | |
| | E RING D6 | | |
| | BEARING F688 (F1680) | | |
| | GCL Shaft-C Ass'y | GCL Roller-C | |
| | | GCL Shaft-C | |
| | PST1 2.6x8 | | |
| | GCL Shaft-B Ass'y | GCL Roller-B | |
| | | GCL Shaft-B | |
| | | GCL Arm-R Ass'y | GCL Arm-R |
| | | | PST1 2.6X8 |
| | | | GCL Arm Spring |
| | | | GCL Arm Bracket |
| | | GCL Arm-L Ass'y | GCL Arm-L |
| | | | PST1 2.6X8 |
| | | | GCL Arm Spring |
| | | | GCL Arm Bracke |

| Part 2 or Module | Ass'y 1 | Ass'y 2 | Ass'y 3 |
|---|---|---|---|
| GCL Ass'y | GCLPulley | | |
| | E RING D6 | | |
| | BEARING F688 (F1680) | | |
| | GCL Shaft-A Ass'y | GCL Roller-A | |
| | | GCL Shaft-A | |
| | Trans UV Glass Ass'y | | |

### 2.1.7. Base Framework Part List

| Part 2 or Module | Ass'y 1 | Ass'y 2 | Ass'y 3 |
|---|---|---|---|
| Divert Part | E RING D5 | | |
| | Wave Washer | | |
| | BEARING F686ZZ (F1360) | | |
| | Divert Ass'y | | |
| SEMS M4X8 P10 | | | |
| L-Side Framework Part | L-Side Ass'y | | |
| | E RING D6 | | |
| | Idle Pulley Ass'y | | |
| | SEMS M3X6 P6 | | |
| | Double Belt Guide | | |
| | DS3M 918 | | |
| | SEMS M3X6 P6 | | |
| | Interface Ass'y | | |
| | SEMS M6X12 P13 | | |
| | Main Motor | Motor Pulley | |
| | | QM 5X6 | |
| | | Motor | |
| | SEMS M3X6 P6 | | |
| | Clutch Stopper | | |
| | QM 3X5 | | |
| | Clutch | Clutch Body | |
| | | Clutch Spacer-B | |
| | | Clutch Pulley Ass'y | |
| | | DU0808 | |
| | SEMS M3X6 P6 | | |
| | Swing Selector Ass'y | PMS M3X6 | |
| | | Spacer Swing Selector | |
| | | Divert Bracket Ass'y | SEMS M4X8 P10 |
| | | | SWG Bracket- Top |
| | | | Swing Selector |
| | | | SWG Bracket- Bottom |
| | SEMS M4X8 P10 | | |
| | Idle Pulley Bracket Ass'y | Belt Support Bracket | |
| | | E RING D6 | |
| | | Idle Pulley Ass'y | |
| SEMS M4X8 P10 | | | |

| Part 2 or Module | Ass'y 1 | Ass'y 2 | Ass'y 3 |
|---|---|---|---|
| R-Side Framework Part | SEMS M3X6 P6 | | |
| | Main Board | | |
| | Drive Board | | |
| | PCB Support 3X13 | | |
| | SEMS M3X6 P6 | | |
| | PCB Support 3X25 | | |
| | PCB Support 3X10 | | |
| | SEMS M3X6 P6 | | |
| | PCB Cover | | |
| | SEMS M3X6 P6 | | |
| | Wire Holder | | |
| | SEMS M3X6 P6 | | |
| | Encorder Ass'y | | |
| | SEMS M4X12 P8 | | |
| | Stopper Block | | |
| | SEMS M3X8 | | |
| | QM 4X4 | | |
| | Brake | Brake Body | |
| | | Brake Plate | |
| | | Brake Friction | |
| | R-Side Frame | | |
| Bottom Framework Part | SEMS M3X6 P6 | | |
| | SMPS | | |
| | SEMS M3X8 P8 | | |
| | Rubber Leg | | |
| | Bottom Plate | | |

## 2.2. Electronic Part List

**Electronic Part List break-down**

| | |
|---|---|
| **Electronic Part List** | **Harness Part List** |
| | **PCB Part List** |
| | **Sensor Part List** |
| | **Actuator Part List** |

**Electronic Part List**

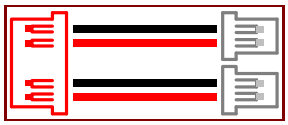
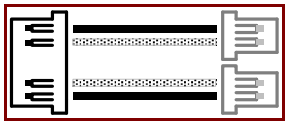
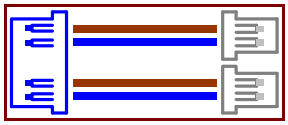
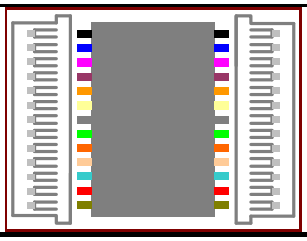
**2.2.1. Harness Part List**

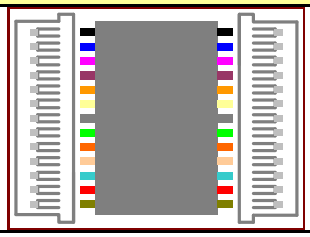
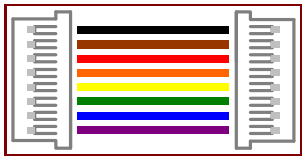
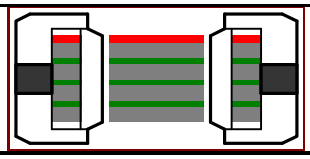
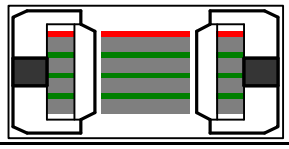
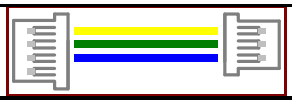
**2.2.2. PCB Part List**

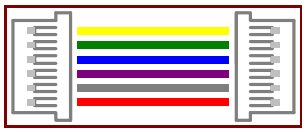
**2.2.3. Sensor Part List**

**2.2.4. Actuator Part List**

### 2.2.1. Harness Part List

| HARNESS Of position | Number | Figure | Line Color | Connector housing | PCB for connection |
|---|---|---|---|---|---|
| Main Board | H1 |  | Black Red Black Red | J111 | Count sensor A LED PCB |
| Main Board | H2 |  | Black White White Balck | J113 | Count sensor A TR PCB |
| Main Board | H3 | | Gray Blue Gray Blue | J114 | Count sensor C LED PCB |
| Main Board | H4 | | Gray Orange White Red | J116 | Count sensor C TR PCB |
| Main Board | H5 |  | Brown Blue Brown Blue | J115 | Count sensor D LED PCB |
| Main Board | H6 | | Brown Yellow Red Orange | J117 | Count sensor D TR PCB |
| Main Board | H7 | | Black Red | J118 | Reject sensor LED PCB |
| Main Board | H8 | | Black Gray | J119 | Reject sensor TR PCB |
| Main Board | H10 | | Orange Red White | J120 | Solenoid Interrupt PCB |
| Main Board | H11 |  | Shield Cable | J122 | 4CH Reflection CIS |

| HARNESS of position | Number | Figure | Line Color | Connector housing | PCB for connection |
|---|---|---|---|---|---|
| Main Board | H12 |  | Shield Cable | J123 | 4CH TransmitCIS |
| Main Board | H13 |  | Black<br>Brown<br>Red<br>Orange<br>Yellow<br>Green<br>Blue<br>Violet | J105 | External PCB |
| Main Board | H14 | | Yellow<br>White<br>Green<br>Blue | J108 | Display PCB |
| Main Board | H15 |  | Flat Cable | J103 | Bottom sensor PCB |
| Main Board | H16 |  | Flat Cable | J102 | Top sensor PCB |
| Driver Board | H17 | | Black<br>Red<br>Brown | J203 | Kicker Roller Interrupt PCB |
| Driver Board | H18 |  | Yellow<br>Green<br>Blue | J202 | Display PCB |
| Top PCB | H19 | | Yellow<br>Green<br>Blue<br>Violet<br>Gray<br>Red | J304 | UV Reflect Sensor PCB |
| Top PCB | H20 | | Yellow<br>Green<br>Blue<br>Violet | J305 | UV Transmit Sensor PCB |
| Top PCB | H21 | | Red<br>Black | J307 | Photo LED Left PCB<br>(Count sensor B) |

| HARNESS of position | Number | Figure | Line Color | Connector housing | PCB for connection |
|---|---|---|---|---|---|
| Top PCB | H22 | | Black<br>Blown<br>Red<br>Orange<br>Green | J302 | MG Left Sensor PCB |
| Top PCB | H23 | | Red<br>Black | J309 | Photo LED Right PCB (Count Sensor B) |
| Top PCB | H24 | | Black<br>Blown<br>Red<br>Orange<br>Green | J303 | MG Right Sensor PCB |
| Bottom PCB | H25 | | White<br>Black | J301 | Photo TR Left PCB (Count sensor B) |
| Bottom PCB | H26 | | White<br>Black | J302 | Photo TR Right PCB (Count sensor B) |
| Bottom PCB | H27 | | Yellow<br>Green<br>Blue<br>Violet | J306 | UV Transmit Sensor PCB |
| Bottom PCB | H28 |  | Yellow<br>Green<br>Blue<br>Violet<br>Gray<br>Red | J305 | UV Reflect Sensor PCB |
| Display PCB | H29 | | Yellow<br>Green<br>Blue | J104 | Hopper Sensor PCB |
| Driver Board | H30 | | Blue<br>Gray | J208 | Spool Motor |
| SMPS | H31 | | White<br>Yellow<br>Brown<br>Black<br>Red | | Main Board |
| SMPS | H32 | | Blue<br>Gray | | Main Board |

**2.2.2. PCB Part List**

| Name | Picture | Q'ty | dimension | Composition |
|---|---|---|---|---|
| Main Board | | 1pcs | 202*180 | |
| Driver Board | | 1pcs | 180*55 | |
| Top sensor PCB | | 1pcs | 54*180 | |
| Bottom Sensor PCB | | 1 pcs | 40*156 | |
| MG Left Sensor PCB (SB-2000CF) | | Left Sensor 2 pcs | 50*27 | |
| MG Right Sensor PCB (SB-2000CF) | | Right Sensor 2 pcs | 50*27 | |
| UV Reflect Sensor PCB | | top 1 pcs bottom 1 pcs | 60*17.5 | |
| UV Transmit Sensor PCB (SB-2000CF) | | top 1pcs bottom 1 pcs | 27*10 | |
| IR Light source PCB (SB-2000CF) | | 1 pcs | 10*212 | |

| Name | Picture | Q'ty | dimension | Composition |
|---|---|---|---|---|
| Count Sensor PCB (Photo LED) | | 5parts Sensor 5 pcs | 23*6 | Count Sensor A<br>Count Sensor B<br>Count Sensor C<br>Count Sensor D<br>Reject Sensor |
| Count Sensor PCB (Photo transistor) | | 5parts Sensor 5 pcs | 23*6 | Count Sensor A<br>Count Sensor B<br>Count Sensor C<br>Reject Sensor |
| | | | 28*6 | Count Sensor D |
| Hopper Sensor PCB | | 1 pcs | 15*28 | |
| Stacker Sensor PCB | | 2 pcs | 14*70*40 | |
| Display PCB | | 1 pcs | 250*72 | |
| External PCB | | 1 pcs | 100*35 | |
| Power (SMPS) | | 1 pcs | 150*185 | |
| Kicker Roller Interrupt PCB | | 1 pcs | 15*27 | |
| DSP PCB | | 1 pcs | 64*50 | |

### 2.2.3. Sensor Part List

| Name | Picture | Q'ty | dimension |
|---|---|---|---|
| MG Center Sensor | | Center Sensor 1 pcs | mg 13*14*63<br>11*8.5*13 |
| CIS | | Top reflection 1 pcs<br>Bottom transmit 1 pcs | 232*13*18 |
| Encoder | | 1 pcs | 15*27<br>diameter 18.5*18 |

① **MG Center Sensor:** This magnetic sensor is to detect magnetic properties at the center of passing banknotes.

② **CIS:** CIS (Contact Image Sensor) is a scanning module. This CIS sensor is capable of capturing image of a banknote in two directions.

③ **Optical Encoder:** This part is to control the speed of the motor.

**2.2.4. Actuator Part List**

| Name | Picture | Q'ty | dimension |
|---|---|---|---|
| **Main Motor** | | **1 개** | **diameter60*100** |
| **Solenoid** | | **1 개** | **32*38*16** |
| **Clutch** | | **1 개** | **diameter 34*25** |
| **Spool Motor** | | **1 개** | **diameter 37*50** |
| **Brake** | | **1 개** | **diameter 32*17** |

① **Main motor:** This motor supply power to feeding and transport mechanism to feed and transport the banknote through the machine.

② **Solenoid:** Solenoid part controls the diverter and designates the stacking position of each banknote.

③ **Clutch:** This part is to control power to the feeder mechanism.

④ **Spool motor:** This motor is to supply power to Spool which is responsible for stacking banknotes neatly on the stacker.

⑤ **Brake:** This is to block or interrupt power to feeding mechanism.

# 3. How to disassemble SB-2000

In this section, you'll find how to disassemble SB-2000.


**3.1. SB-2000 Partition**

**3.2. Cover Part**

**3.3. Hopper Part**

**3.4. Display Part**

**3.5. Pocket Part – Pocket Stacker**

**3.6. Pocket Part – Stacker Guide**

**3.7. Discrimination Part – GCT Ass'y**

**3.8. Discrimination Part – GCL Ass'y**

**3.9. Transfer Plate Part**

**3.10. Base Framework Part**

**3.11. Electronic Part**

### 3.1. SB-2000 Partition

| Part | | Ass'y |
|---|---|---|
| 3.2. Cover Part | | 3.2.1. Hopper Cover |
| | | 3.2.2. Top Cover |
| | | 3.2.3. Back Cover |
| | | 3.2.4. Side Cover-Right |
| | | 3.2.5. Side Cover-Left |
| | | 3.2.6. Stacker Cover |
| | | 3.2.7. Rear Bottom Cover |
| 3.3. Hopper Part | | 3.3.1. Thickness Ass'y |
| | | 3.3.6. Kicker Roller Ass'y |
| | | 3.3.7. Feed Roller Ass'y |
| | | 3.3.8. GST Ass'y |
| | | 3.3.9. GSL Ass'y |
| 3.4. Display Part | | 3.4.3. Function Cover |
| | | 3.4.4. Display Board Ass'y |
| Pocket Part | 3.5. Pocket Stacker | 3.5.1. Pocket Body Ass'y |
| | | 3.5.3. Pocket Stacker Ass'y |
| | | 3.5.5. Pocket Roller Ass'y |
| | | 3.5.7. Transfer Guide Ass'y |
| | 3.6. Stacker | 3.6.1. Stacker Guide Ass'y |
| | | 3.6.3. Stacker Wheel Ass'y |
| Discrimination Part | 3.7. GCT Ass'y | 3.7.2. GCT Board |
| | | 3.7.3. MG Sensor |
| | | 3.7.4. UV Sensor |
| | | 3.7.5. CIS LED PCB |
| | | 3.7.6. eflection CIS |
| | | 3.7.7. Lock Shaft |
| | | 3.7.8. GCT Shaft-A Ass'y |
| | | 3.7.8. GCT Shaft-B Ass'y |
| | | 3.7.9. LED Sensor Ass'y |
| | | 3.7.10. GCT Guide |
| | | 3.7.11. Glass Plate |
| | | 3.7.12. Acrylic Plate |

| Part | | Ass'y |
|---|---|---|
| Discrimination Part | 3.8. GCL Ass'y | 3.8.1.GCL PCB |
| | | 3.8.2.UV Sensor |
| | | 3.8.3.GCL Shaft-D Ass'y |
| | | 3.8.4.Brush Shaft |
| | | 3.8.5.Trans CIS |
| | | 3.8.6.TR 5mm Sensor Ass'y |
| | | 3.8.7.Encoder Ass'y |
| | | 3.8.8.GCL Shaft-C Ass'y |
| | | 3.8.9.GCL Shaft-B Ass'y |
| | | 3.8.10.GCL Shaft-A Ass'y |
| 3.9. Transfer Plate Part | GGT Ass'y | 3.9.2. GGT Idle Bracket Ass'y |
| | | 3.9.4. LED 5mm Sensor Ass'y |
| | | 3.9.4. GGT Idle Roller Ass'y |
| | | GGT Body |
| | GGL Ass'y | 3.9.6. GGL Idle Ass'y |
| | | 3.9.8. TR 5mm Sensor Ass'y |
| | | 3.9.8. GGL Shaft Ass'y |
| | | GGL Body |
| 3.10. Base Framework Part | Side Framework | 3.10.1. Divert Ass'y |
| | | 3.10.2. Baffle Plate |
| | | 3.10.3. Left Side Framework |
| | | 3.10.7. Right Side Framework |
| | Bottom Framework | 3.10.11. SMPS |
| 3.11. Electronic Part | | 3.11.1. Main Board |
| | | 3.11.2. Driver Board |
| | | 3.11.3. Top PCB |
| | | 3.11.4. Bottom PCB |
| | | 3.11.5. Display PCB |
| | | 3.11.6. Power(SMPS) |

## 3.2. Cover Part

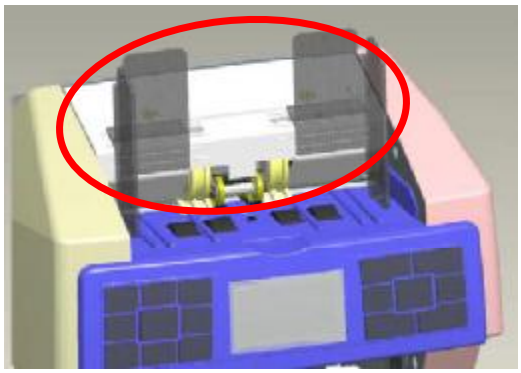
Cover Parts consist of Hopper Cover, Top Cover, Back Cover, Right Side Cover, Left Side Cover, Stacker Cover, Power Cover.

**Cover Part**

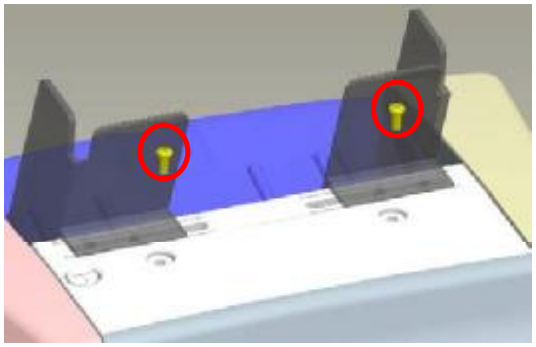
| Part | Ass'y |
|---|---|
| 3.2. Cover Part | 3.2.1. Hopper Cover |
| | 3.2.2. Top Cover |
| | 3.2.3. Rear Cover |
| | 3.2.4. Side Cover-Right |
| | 3.2.5. Side Cover-Left |
| | 3.2.6. Stacker Cover |
| | 3.2.7. Rear Bottom Cover |

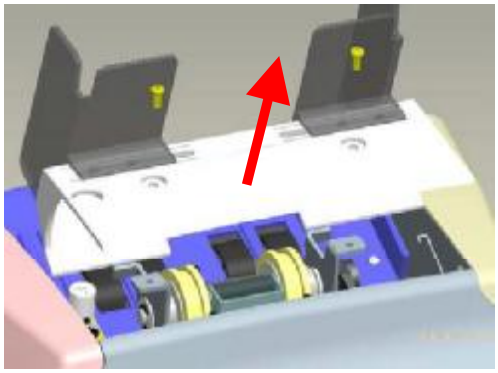
### 3.2.1 Hopper Cover

To remove each cover, you have to remove hopper cover first.

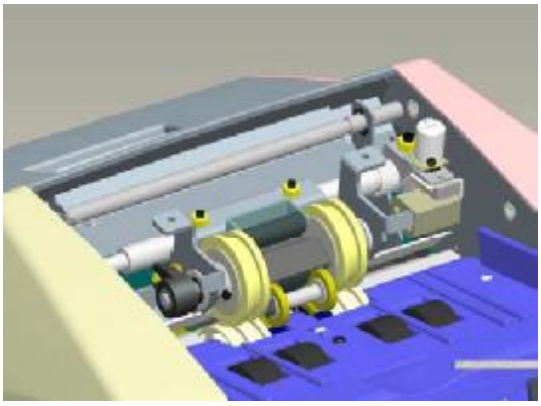


A. Unloose 2 crews to remove the hopper cover.





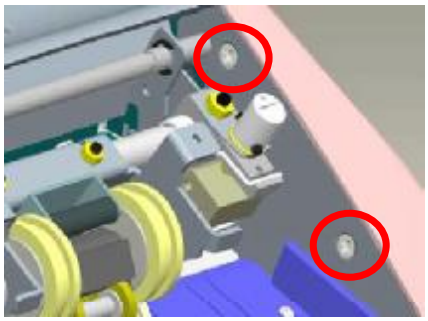
B. Lift up the cover.

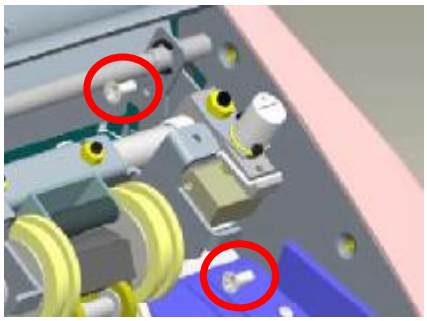


## 3.2.2 Disassemble right side cover

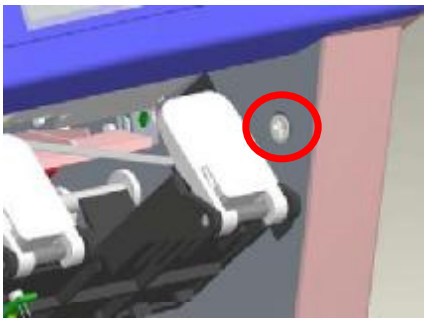
To remove right side cover, you must remove hopper cover first.(3.2.1)

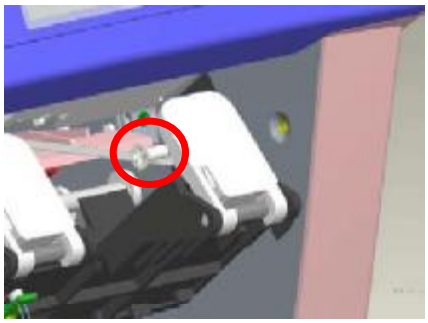
A. You'll see two screws after you remove the hopper cover. unloose the screws.



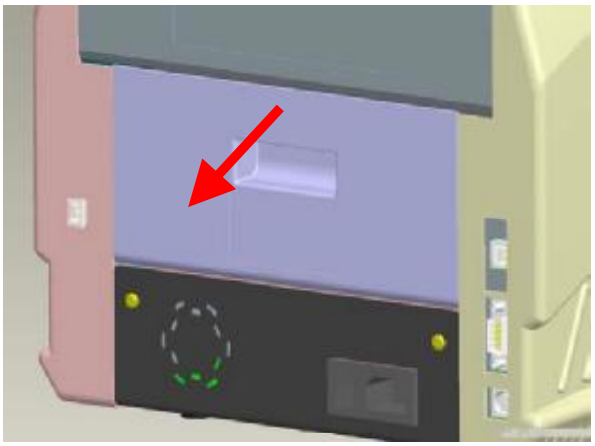


B. unloose the screw.

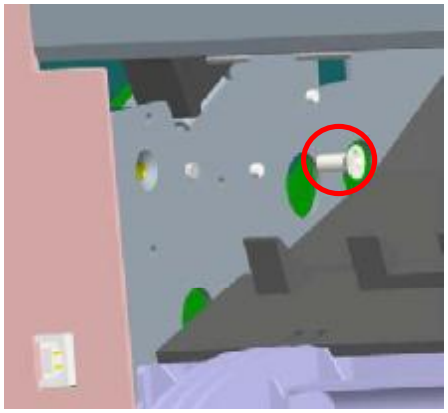




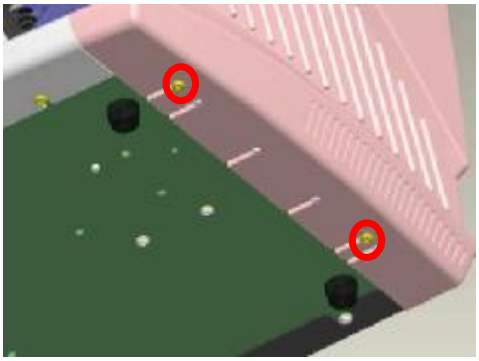
C. Lift up the rear cover to open.

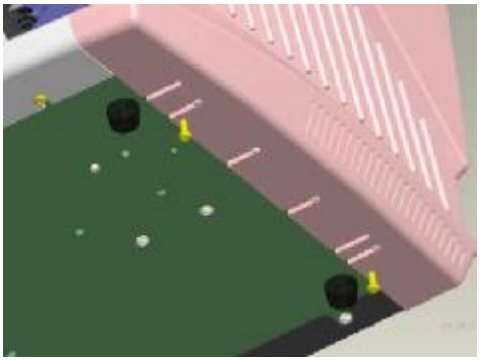


D. unloose the screw.

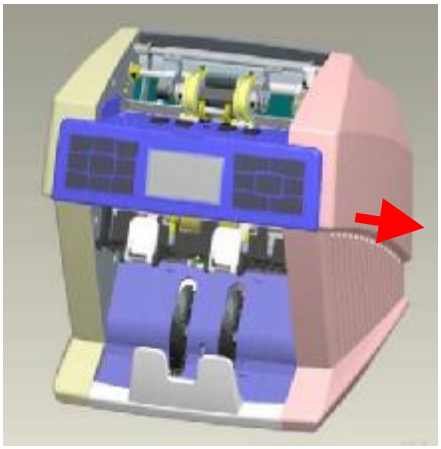


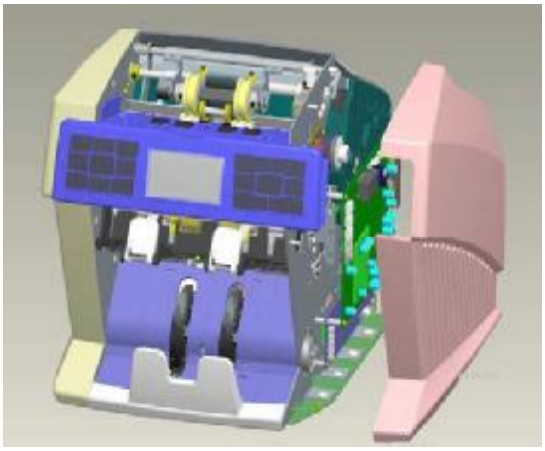
E. unloose the two screw at the bottom.





F. Pull the right side cover to remove it.

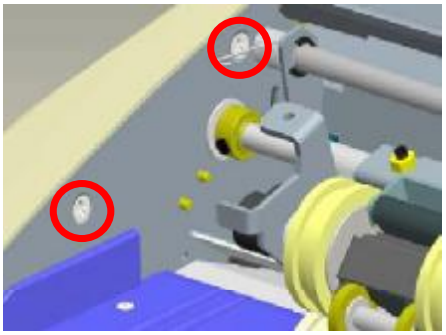


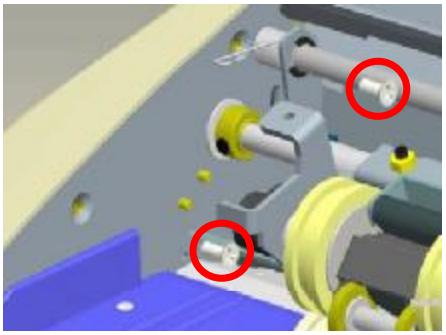


## 3.2.3. Disassemble left side cover

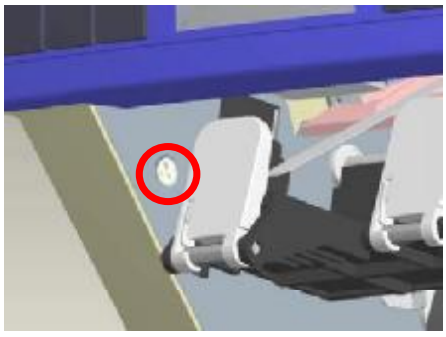
To remove left side cover, you must remove hopper cover first.(3.2.1)

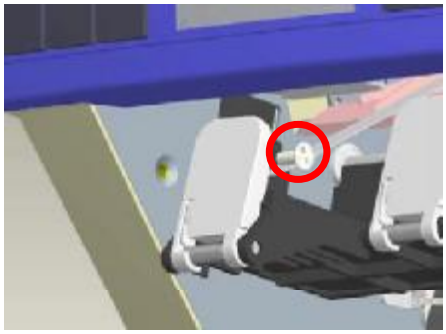
A. You'll see two screws after you remove the hopper cover. unloose the screws.



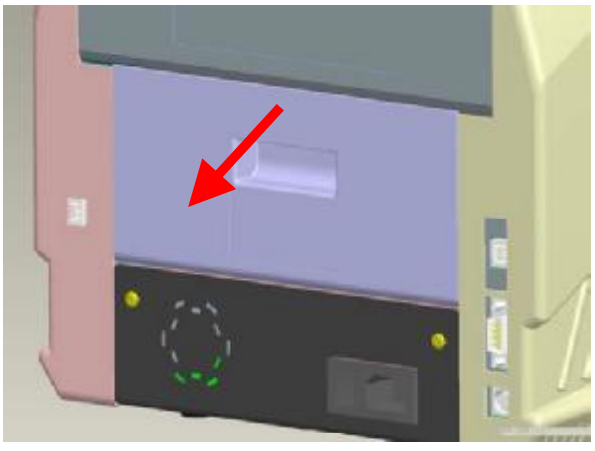


B. unloose the screw.

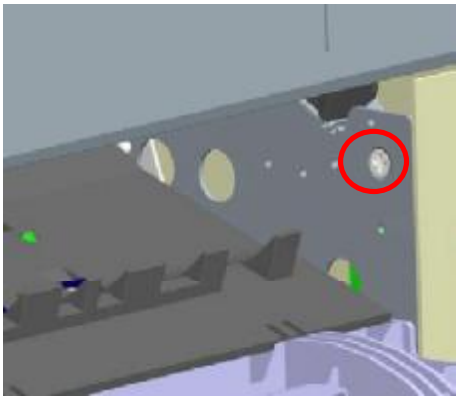


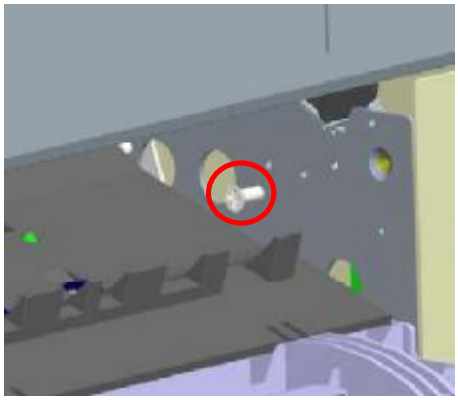


C. Lift up the rear cover to open.

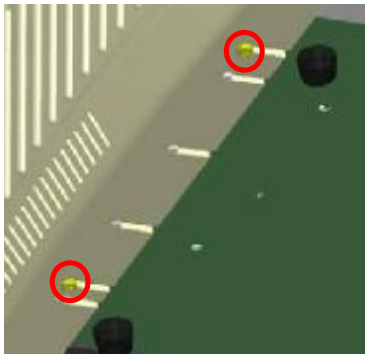


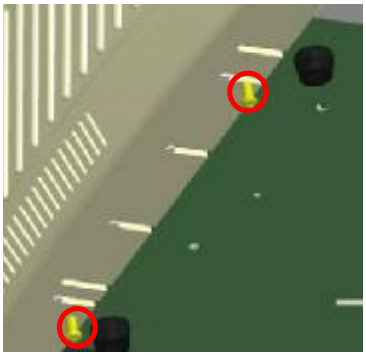
D. unloose the screw.



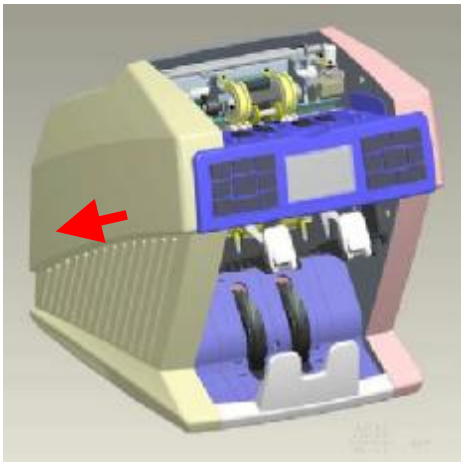


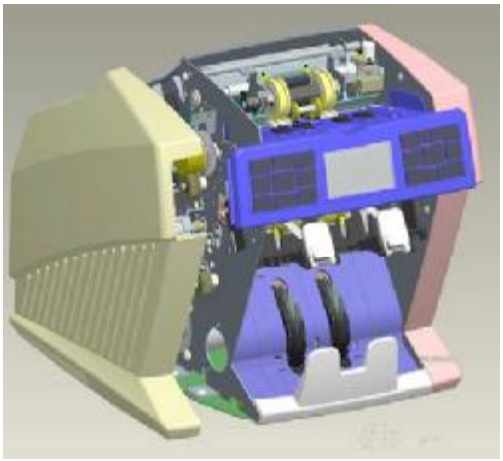
E. unloose the two screw at the bottom.





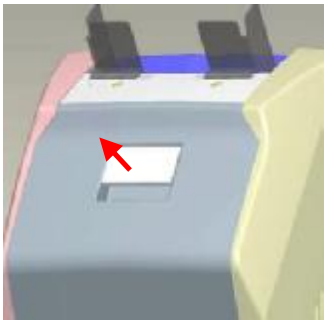
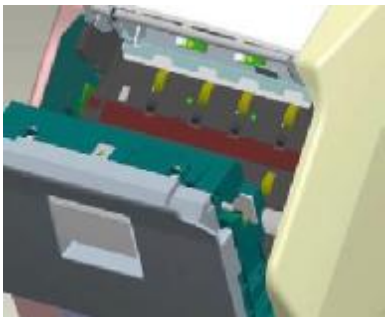
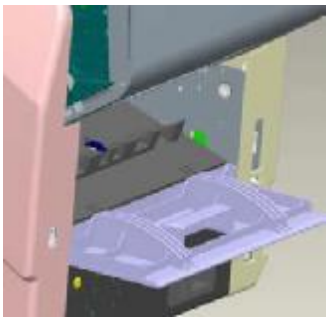
F. Pull the side cover to remove it.



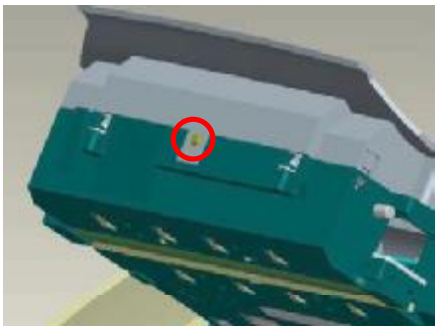
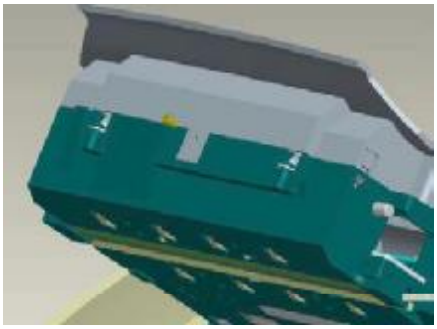


## 3.2.4 Disassemble top cover

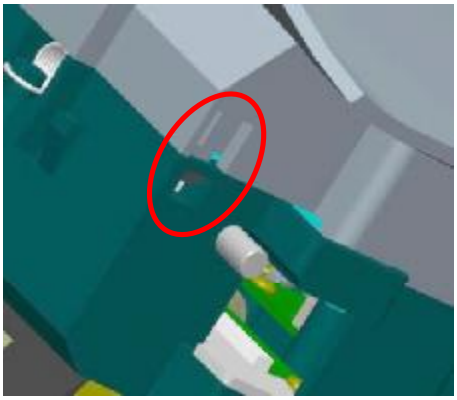
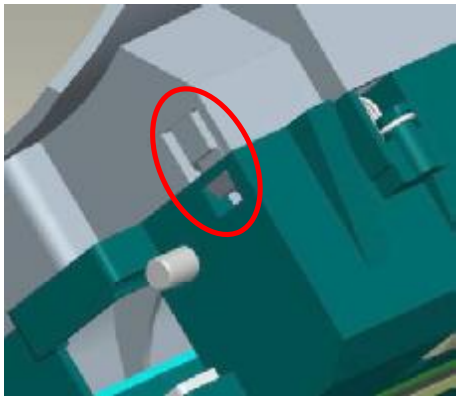
A. Pull the top cover handle to open it. pull the rear cover to open it.

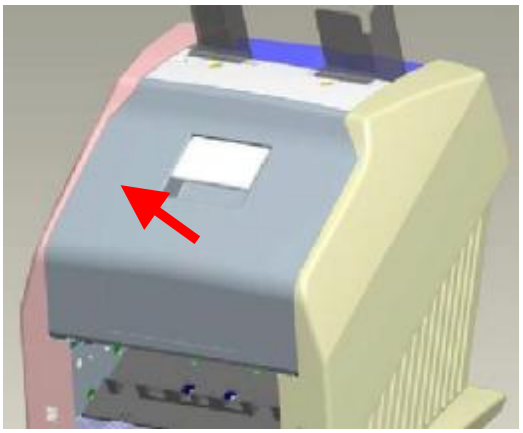
B. Unloose the screw at GCT Assy.

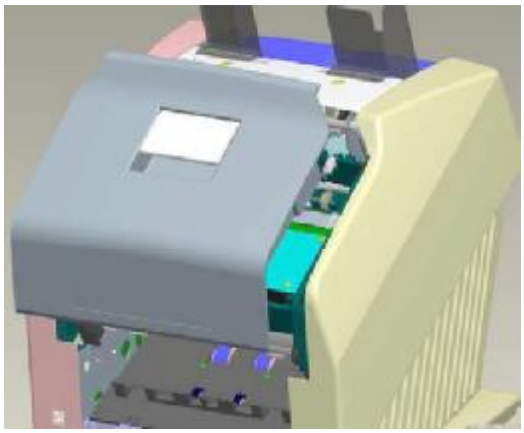



C. Push the hook to seperate.

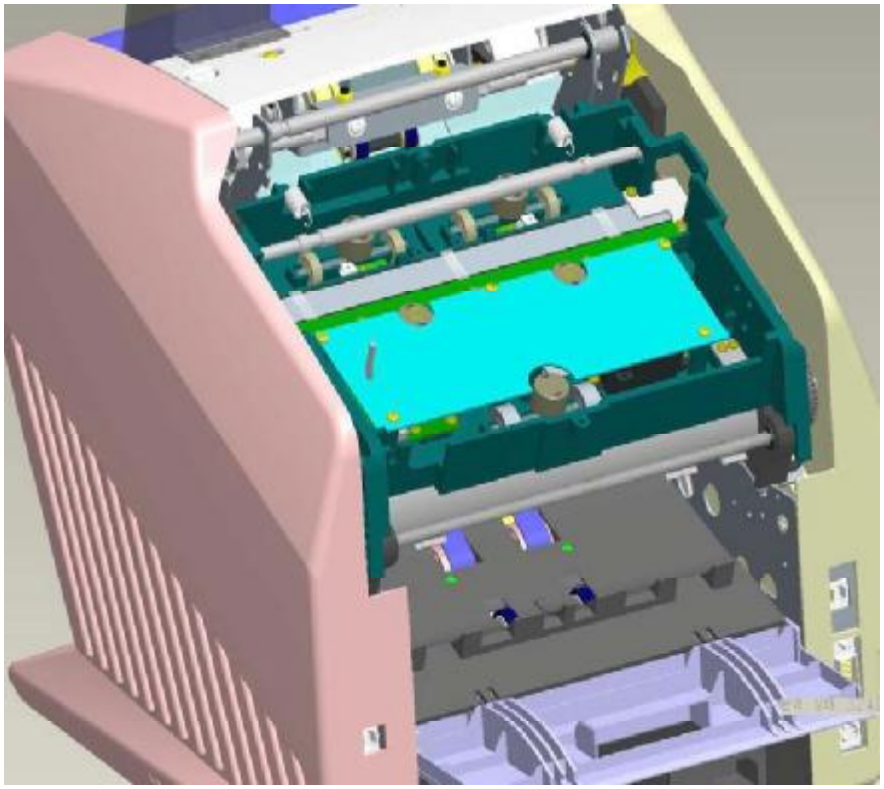



D. Pull the top cover.





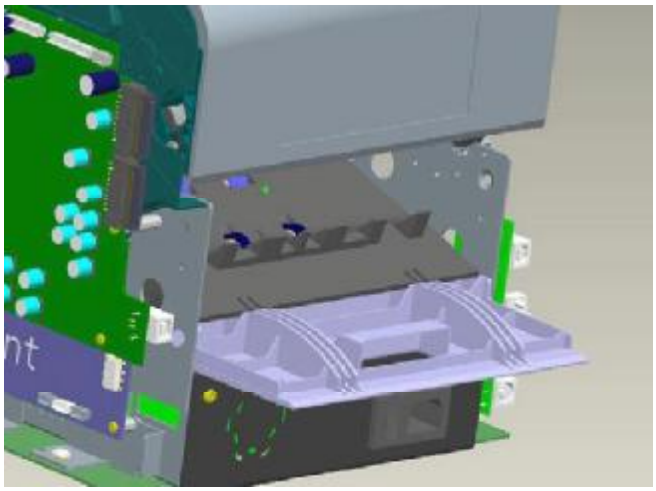
D. Lift up the Top Cover to remove.



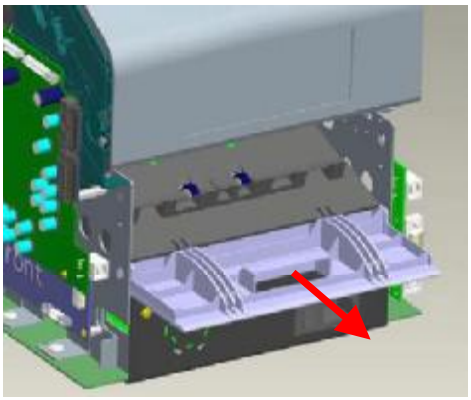
## 3.2.5. Disassemble Rear cover

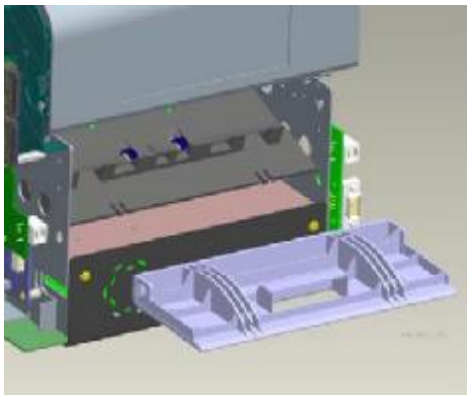
Rear cover is not assembeled by screws.

A. Pull the rear cover handle to open.



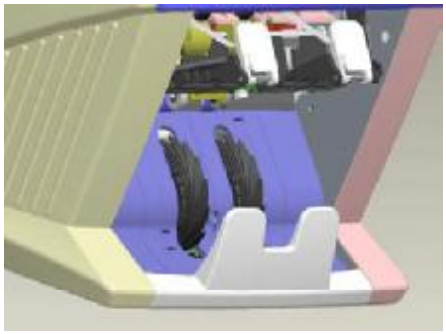
B. Tilt the rear cover and pull to remove.

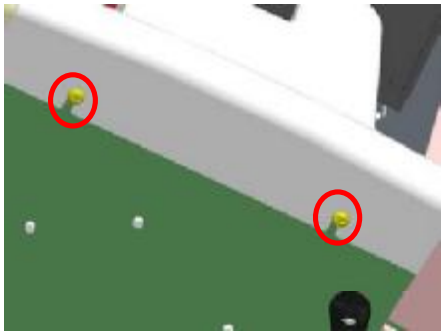




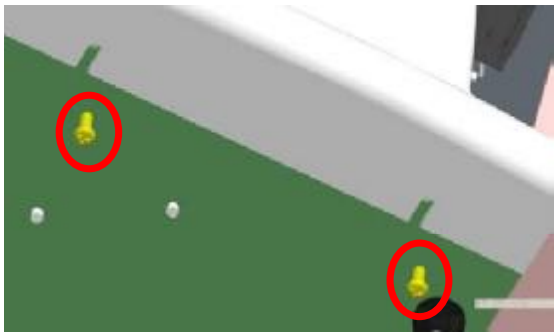
## 3.2.6 Disassemble Stacker cover

A. there's two screws at the bottom.

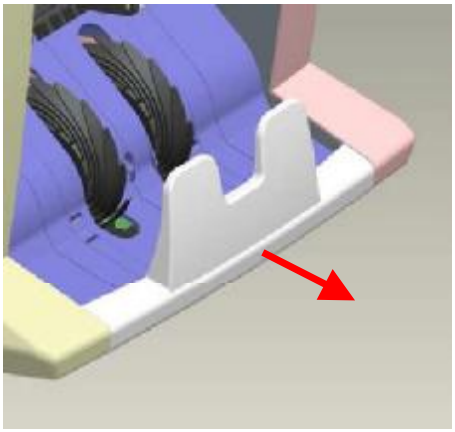


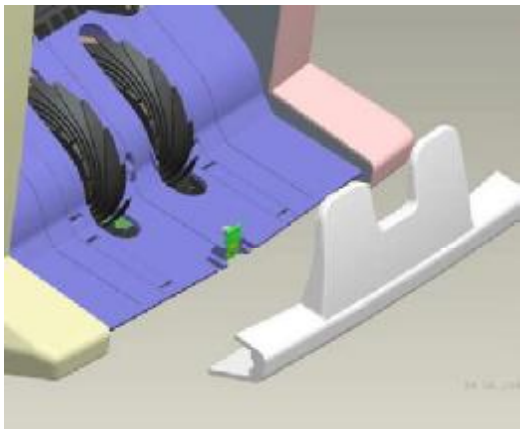


B. Unloose the screws.



C. You'll see the stacker sensor after removing Stacker Cover.

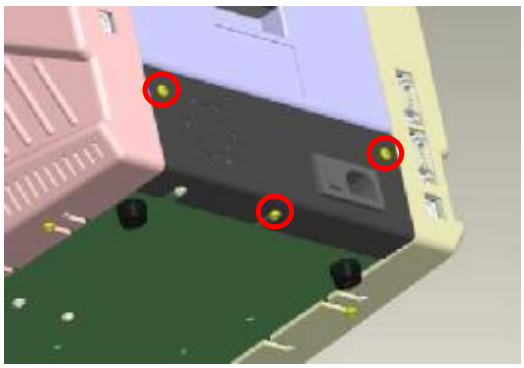


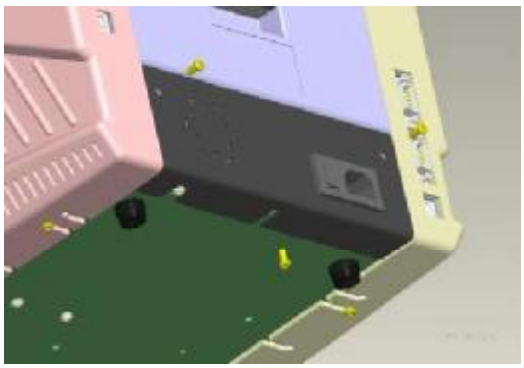


## 3.2.7 Disassemble Rear Bottom cover

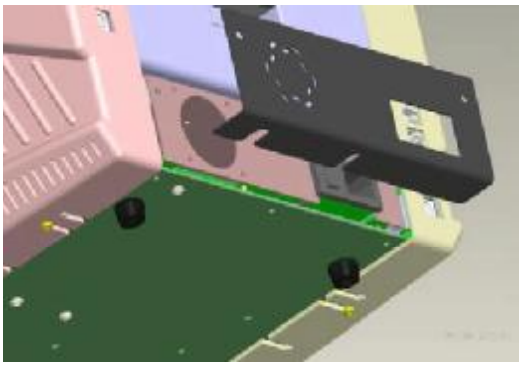
Unloose 4 screws to remove the rear bottom cover. there are two screws at the back, and two screws at the bottom.

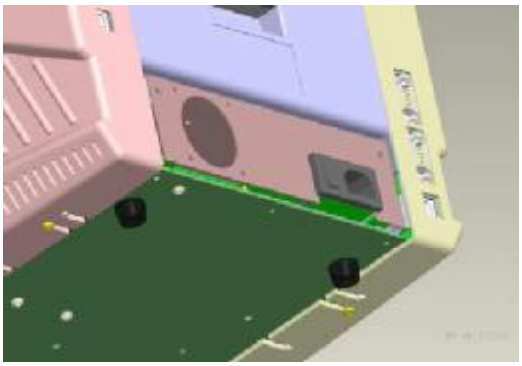
A. Unloose two screws at the back and bottom.





B. Pull the rear bottom cover to remove.





### 3.3. Hopper Part

Hopper Part consist of  Thickness Ass'y, Kicker Roller Ass'y, Feed Roller Ass'y, Upper Hopper Plate Ass'y, Lower Hopper Plate Ass'y.

**Hopper Part**

| Part | | Ass'y | |
|---|---|---|---|
| Thickness Ass'y | Reverse Bracket Ass'y | Clutch Arm Ass'y | |
| | | Reverse Shaft | |
| | | Reverse Roller | |
| | | Insert Roller Ass'y | |
| | | Reverse Bracket | |
| | | Pinch Roller Ass'y | Pinch Bracket |
| | | | Pinch Arm |
| | | | Pinch Spring |
| | | | Pinch Arm Shaft |
| | | | Pinch Shaft |
| | | | Pinch Roller |
| | Thickness Shaft Ass'y | Thickness Shaft | |
| | | Thickness Shaft Stopper | |
| Kicker Roller Ass'y | Kicker Roller Ass'y | Feed Center Rubber | |
| | | Kicker Shaft | |
| | | Kicker Pulley | |
| | Kicker Disk | | |
| Feed Roller Ass'y | Feed Roller | Feed Center Rubber | |
| | | Feed Side Rubber | |
| | | Feed Roller | |
| | Feed Shaft | | |
| | Feed Pulley | | |
| GGT Ass'y | | GGT Plate | |
| | | GGT Idle Bracket Ass'y | |
| | | LED 5mm Sensor Ass'y | |
| GGL Ass'y | | GGL Plate | |
| | | TR Sensor Ass'y | |

## Disassemble Hopper Part

### 3.3.1. Thickness Ass'y

### 3.3.2. Reverse Bracket Ass'y와 Thickness Shaft Ass'y

### 3.3.3. Reverse Bracket Ass'y

### 3.3.4. Thickness Shaft Ass'y

### 3.3.5. Pinch Roller Ass'y

### 3.3.6. Kicker Roller Ass'y

### 3.3.7. Feed Roller Ass'y

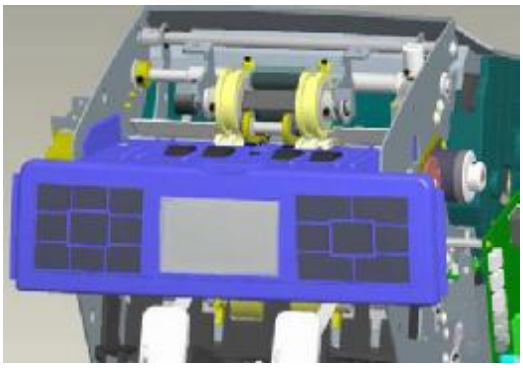
### 3.3.8. Upper Hopper Plate Ass'y

### 3.3.9. Lower Hopper Plate Ass'y

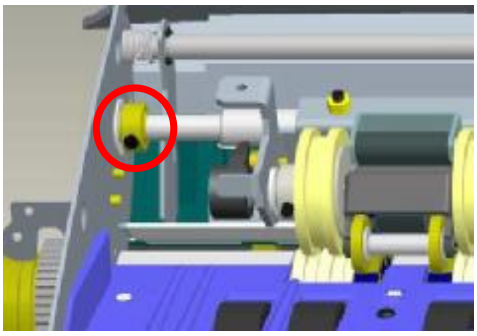
## 3.3.1 Disassemble Thickness Assy

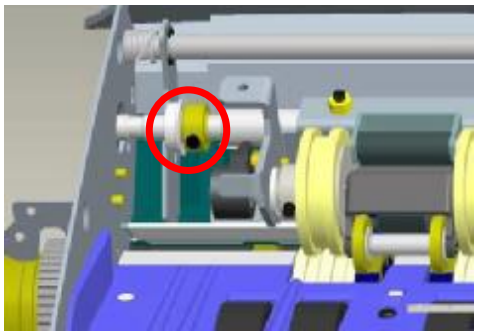
To remove Thickness Assy, you have to remove Hopper cover and Side covers first.

A. Remove the side covers as below figure.

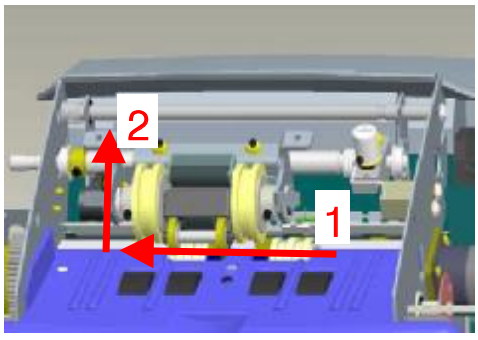


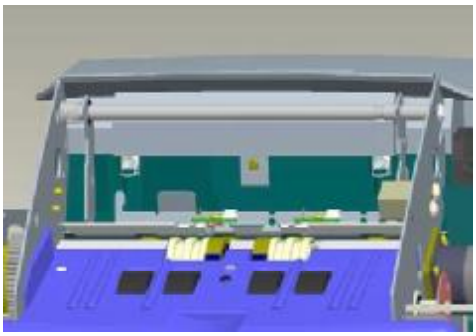
B. Unloose the stripper bolt to release shaft bearing.





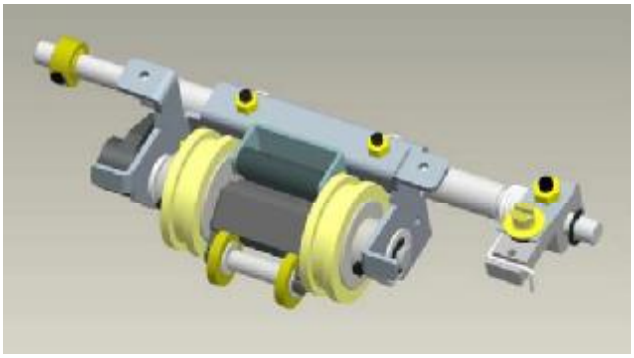
C. release from the right side frame and lift the thickness assy to remove.



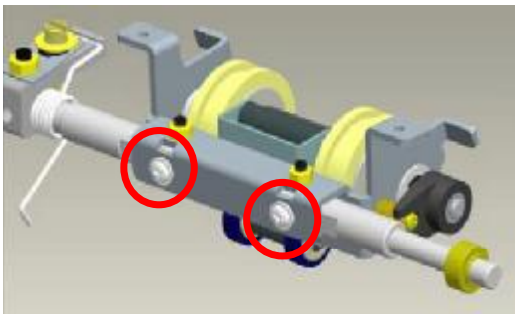



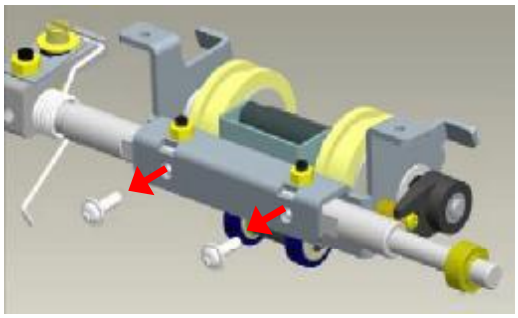
## 3.3.2 Disassemble Reverse bracket assy and Thickness shaft assy

Thickness Ass'y consist of  Reverse Bracket Ass'y, Thickness Shaft Ass'y. Reverse Bracket Ass'y consist of Clutch Arm Ass'y, Reverse Roller, Reverse Shaft, Insert Roller Ass'y, Reverse Bracket, Pinch Roller Ass'y.

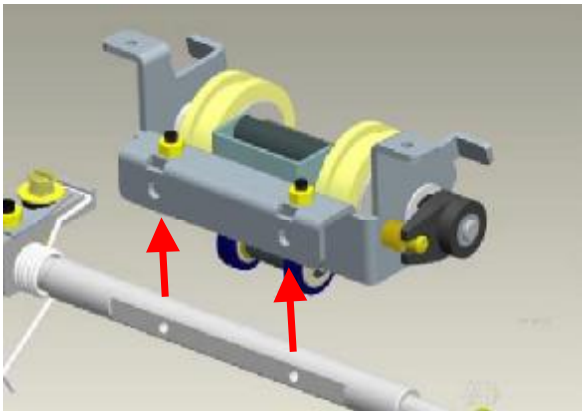


A. Unloose two screw at the front to separate from the Thickness assy shaft.



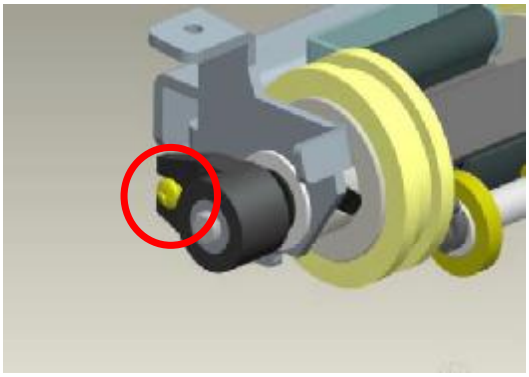


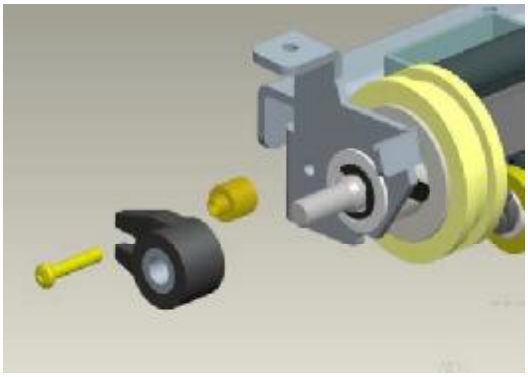
B. Lift up to remove.



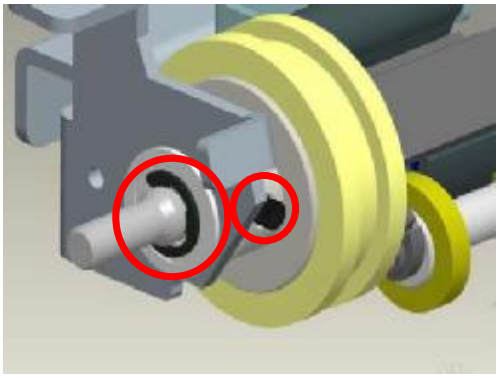
## 3.3.3 Disassemble Reverse Bracket Assy

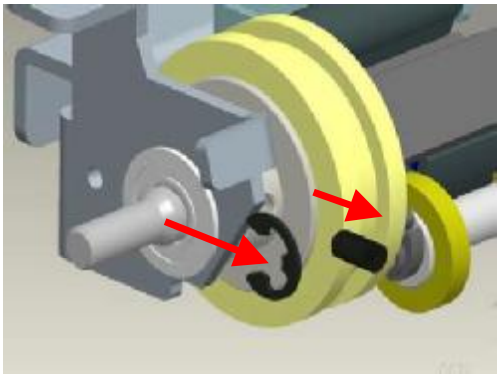
A. Unloose the screw on the left to remove cluch arm assy.



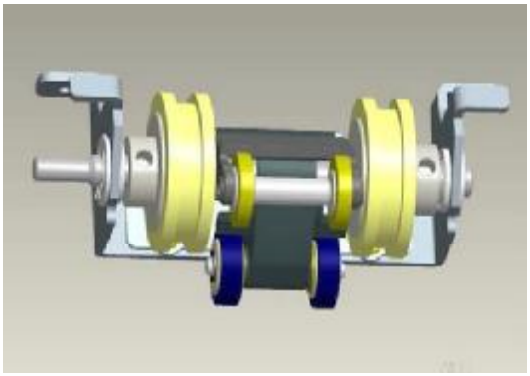


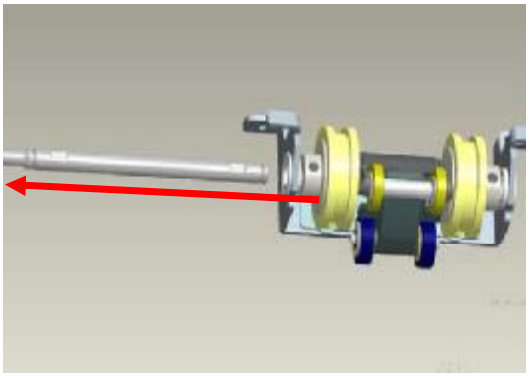
B. Remove the E-ring and lock pin.



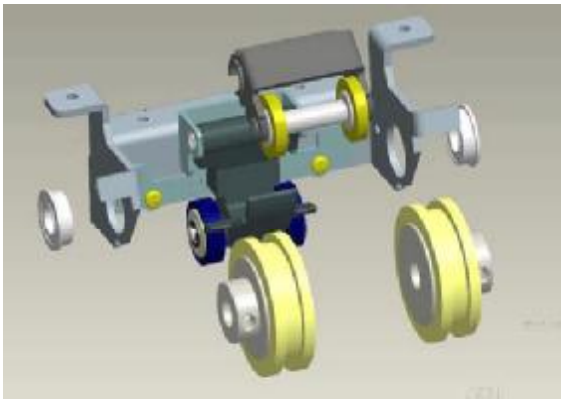


C. Pull the reverse shaft.

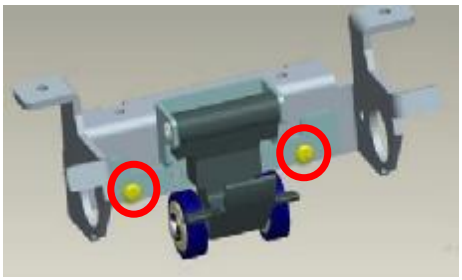


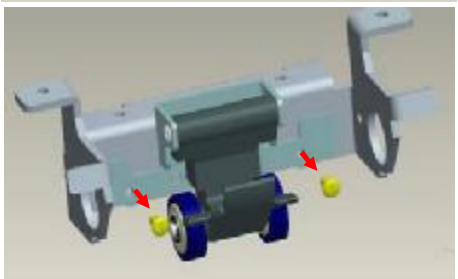


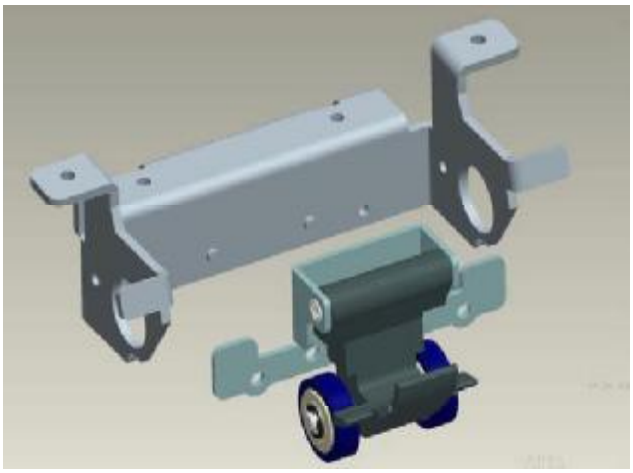
D. These break into Reverse Roller, Reverse Shaft, Insert Roller Ass'y, Reverse Bracket, Pinch Roller Ass'y.



E. unloose two screws to serate pinch roller assy from the reverse bracket.

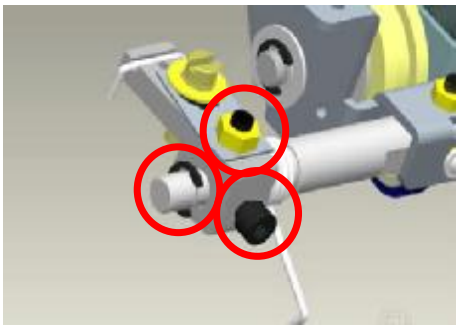


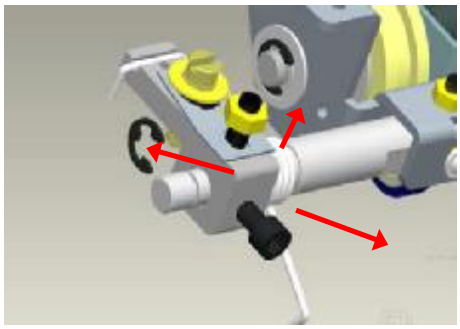




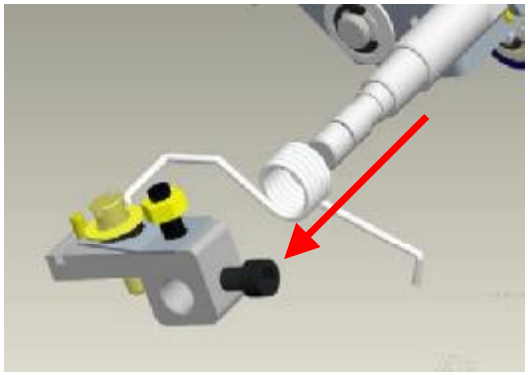
## 3.3.4 Disassemble Thickness Shaft Assy

A. Unloose two bolts that support thickness shaft assy. Remove E-ring.





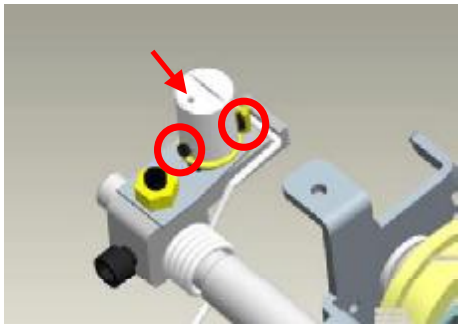
B. now Thickness shaft stopper and thickness spring are seprated form the thickness shaft.



* How to disassemble Adjust cab

It is not often to change adjust cab but in case of replacing rever roller, you need to reassemble the adjust cab.

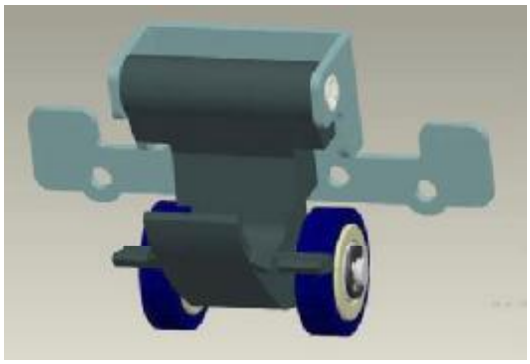
Unloose the stripper bolt in the red circle to remove the cab and make sure the dot mark points the 0 on the hopper cover when you assemble.



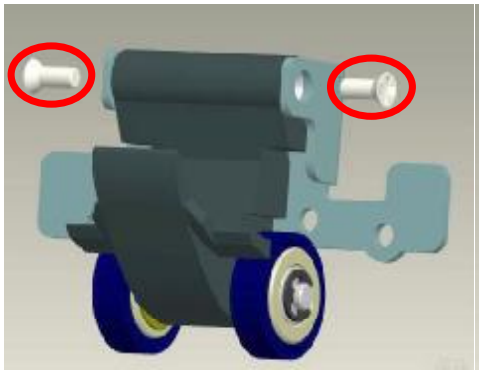
## 3.3.5. Disassemble Pinch Roller Assy

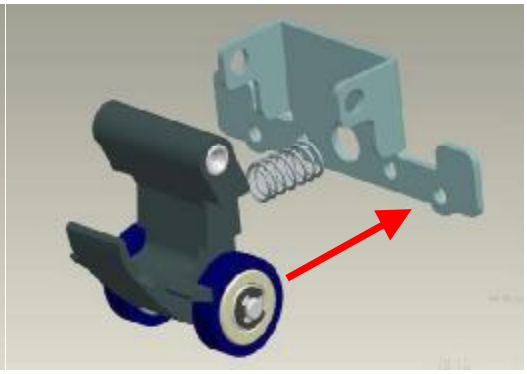
Disassemble pinch roller to replace pinch roller and pinch spring.

A. Pinch roller assy

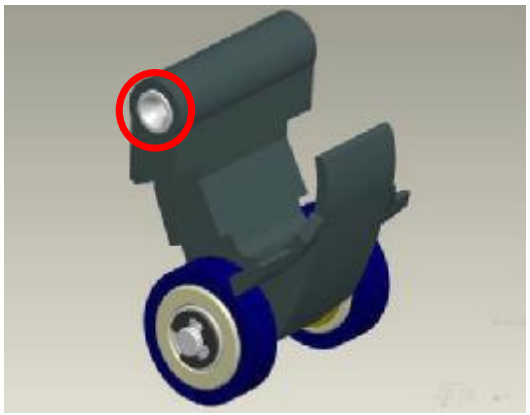


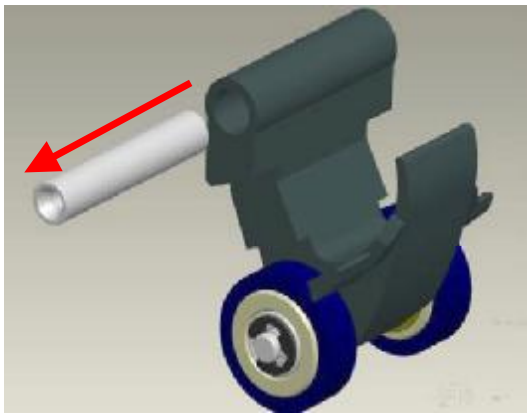
B. Unloose two bolts that support pinch arm.



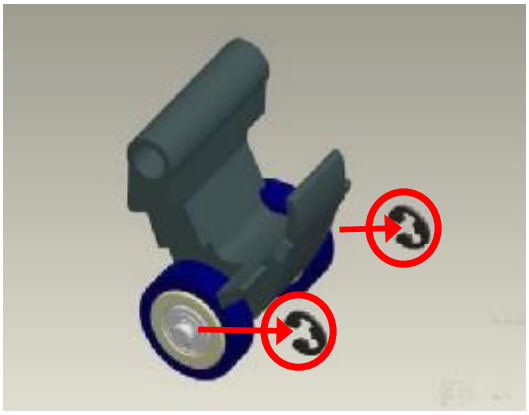


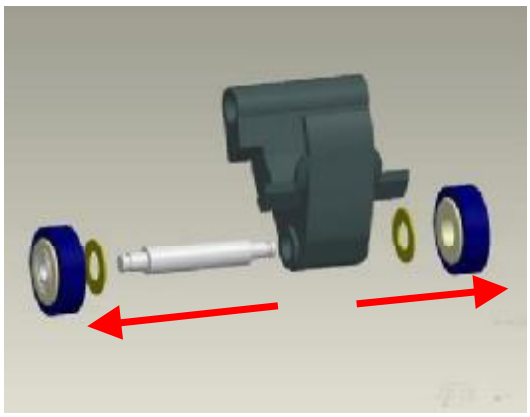
C. Pull the pinch arm.





D. Remove two E-ring to seperate the pinch roller from pinch arm.

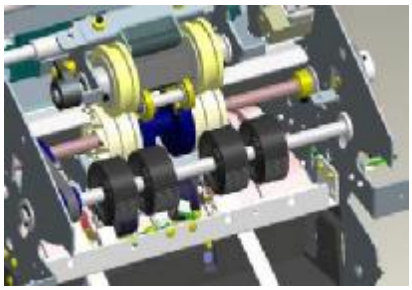




## 3.3.6. Disassemble Kicker roller assy

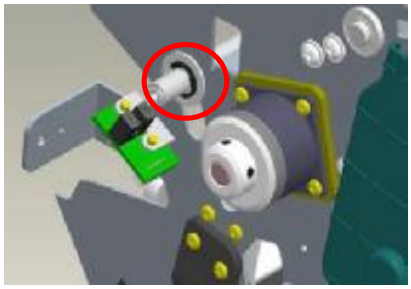
Disassemble hopper cover, side covers and function cover first befor you disassemble the kicker roller assy.

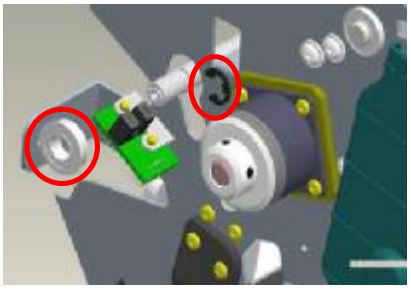
A. Remove covers so that you can see kicker roller assy at hopper part.



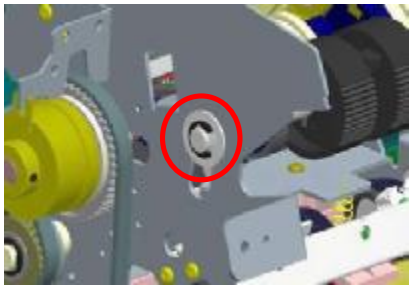
B. Unloose the screw on the right to remove the kicker disk.

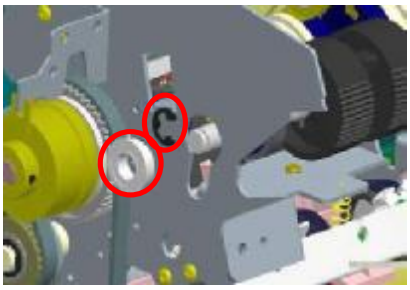
C. Remove E-ring and bearing at the kicker disk.



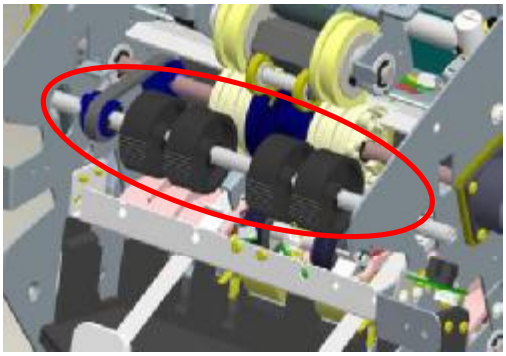


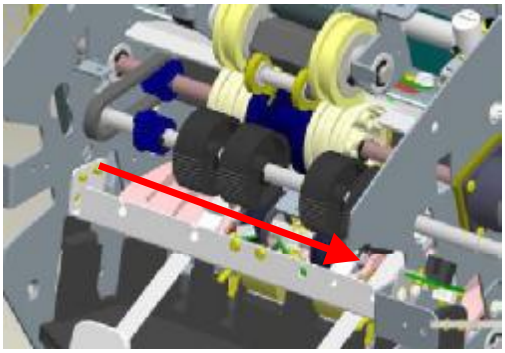
D. Remove E-ring at the left side frame.



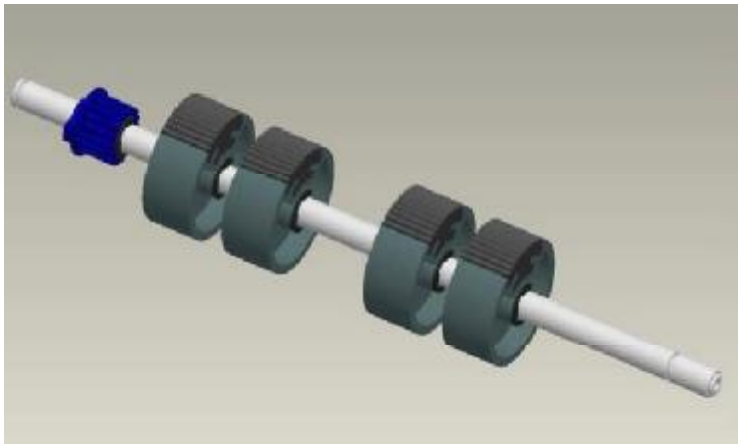


E. Push and lift the kicker roller assy to remove.

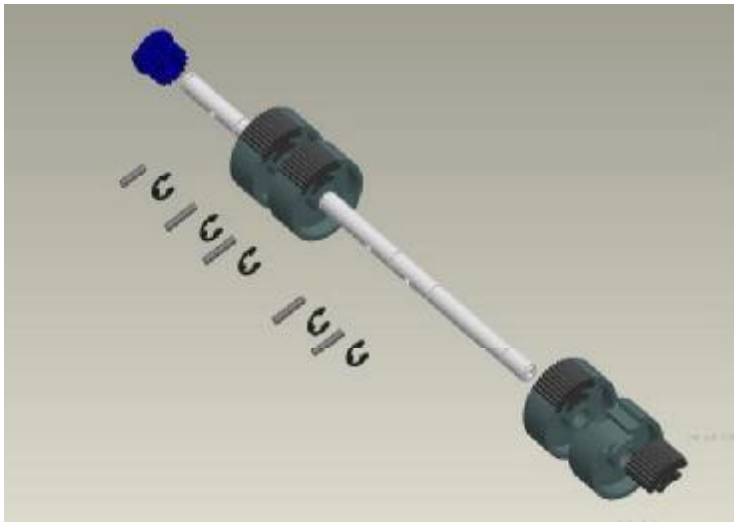




F. Kicker roller assy.



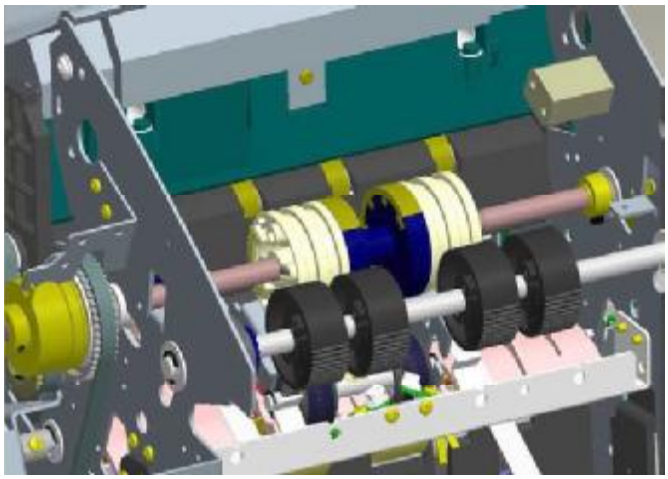
G. Remove 3 E-rings and pins to serepate the kicker rollers from the shaft.



## 3.3.7 Disassemble Feed Roller Assy

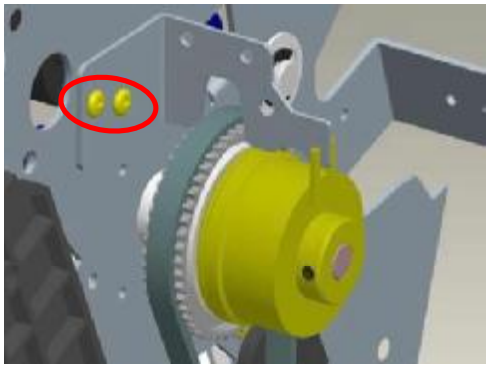
Remove Hopper cover, Side Cover-L/R, Function Cover, GST Ass'y, GSL Ass'y와 Thickness Ass'y before you remove the  Feed Roller Ass'y

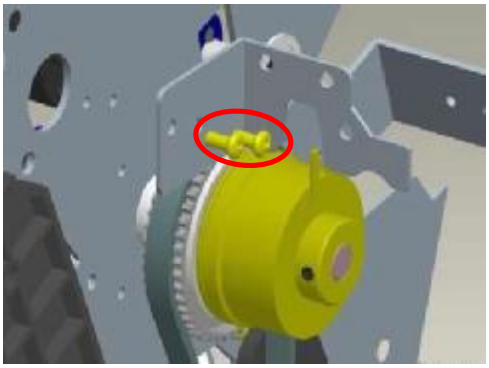
A. You'll see Feed Roller Assy after you remove the hopper cover and thickness Assy.



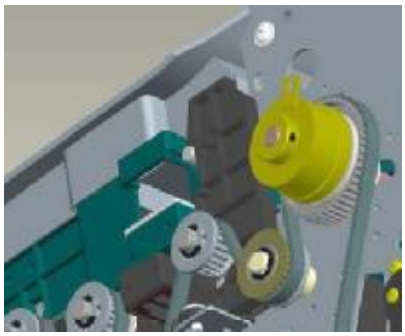
B. Remove pins in the brake.

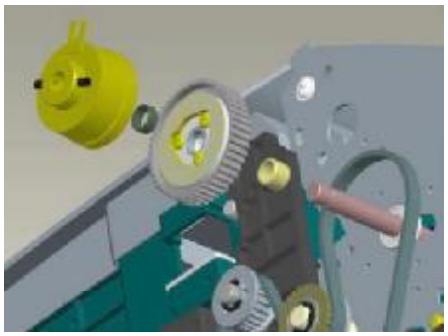
C. Unloose two bolts to remove belt guide bracket.



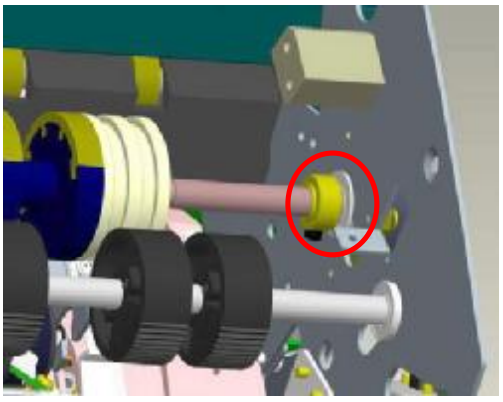


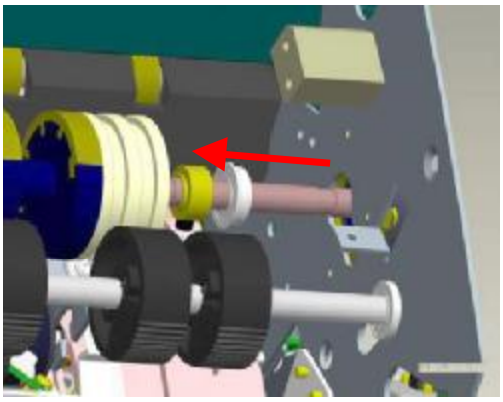
D. Disassemble the Clutch



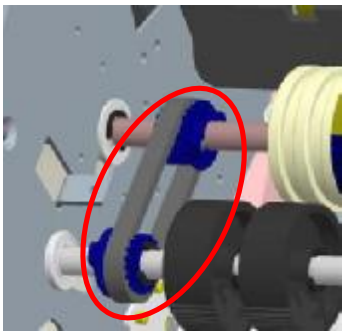


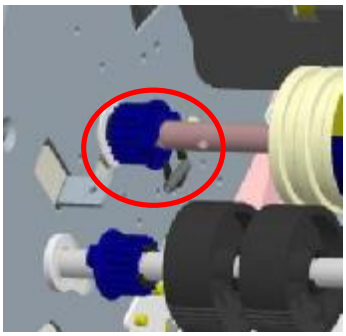
E. After removing Clutch, you'll see the shaft and bearing. remove the bearing and shaft.

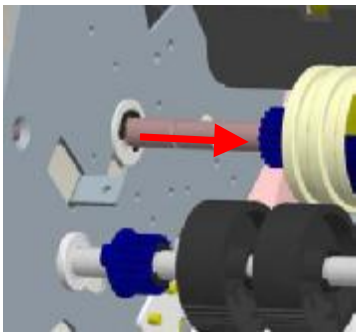




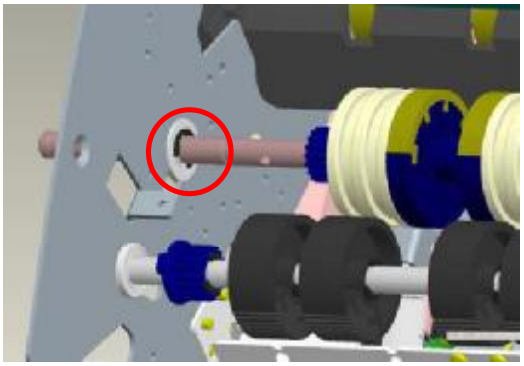
F. Remove the belt that connect Feed roller assy to kicker roller Assy. Remove E-ring.

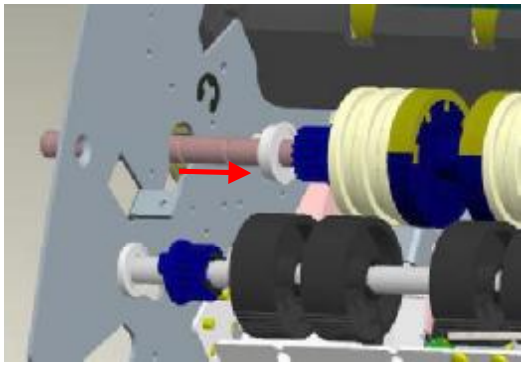




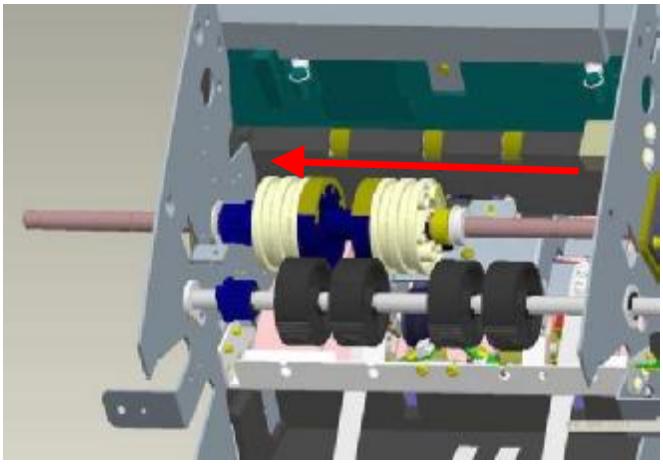


G. Remove E-ring on the left bearing.

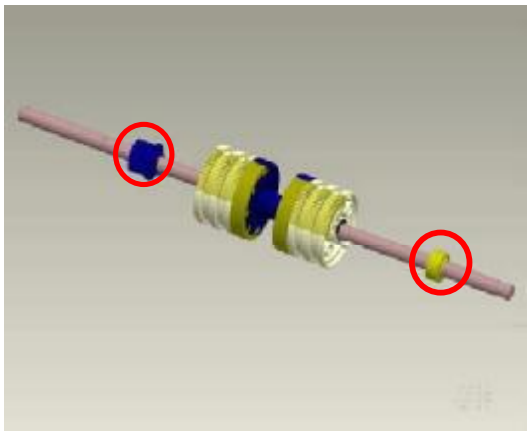


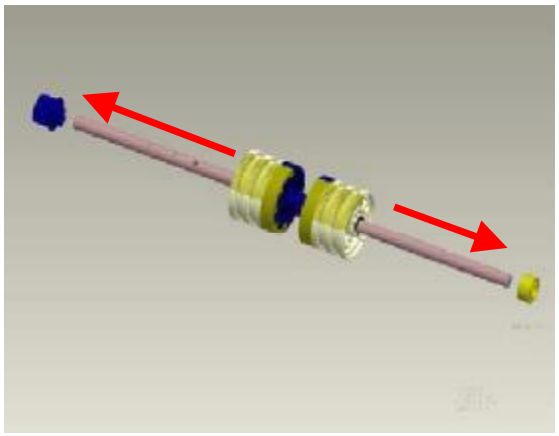


H. Slide the Feed roller assy to the left and lift to separate from the frame.

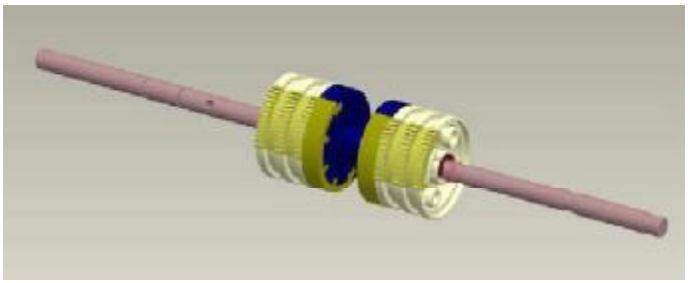


I. Pull the Feed pulley and Bearing to remove.

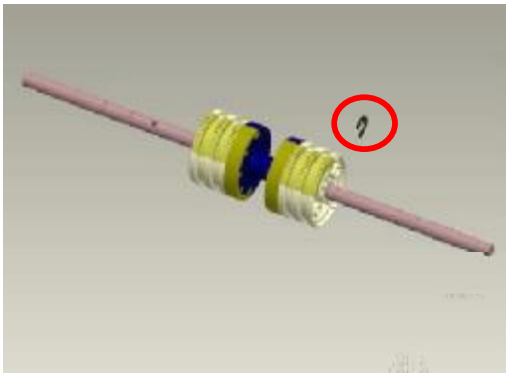


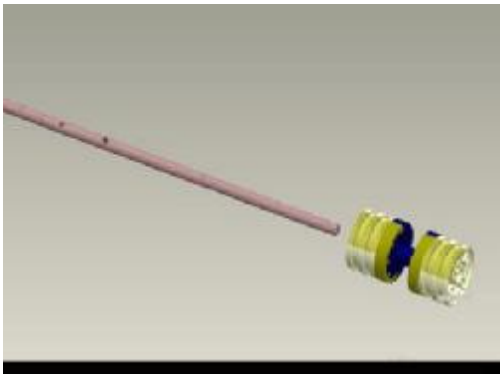


J. Feed Roller assy

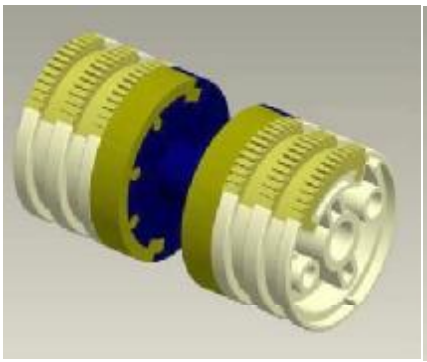


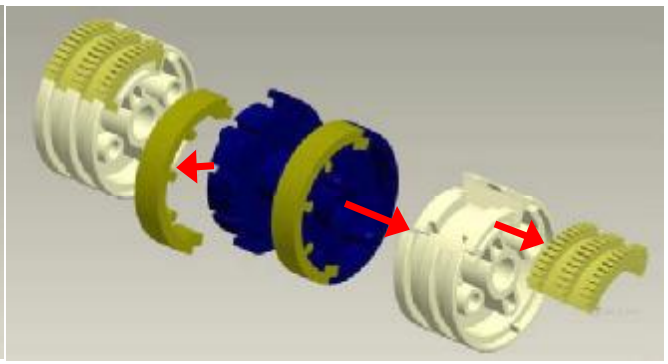
K. Remove E-rings and pins on the feed rollers to serate from the shaft.





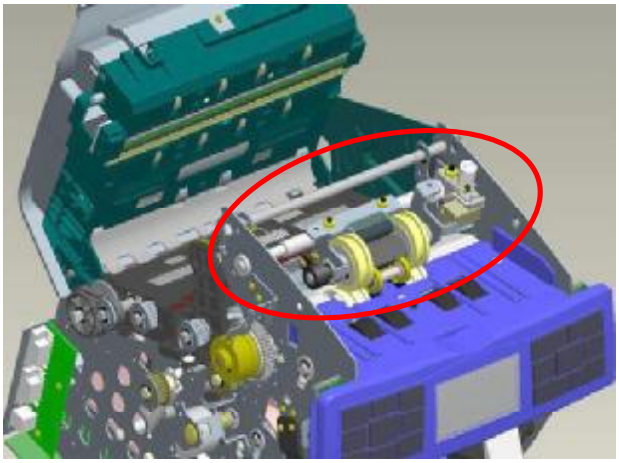
L. Feed Center Rubber와 Feed Side Rubber를 가볍게 옆으로 밀어 분리하여 주십시오.



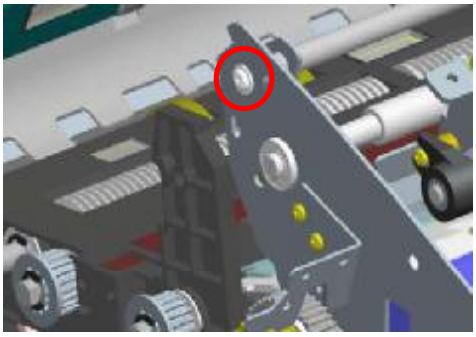


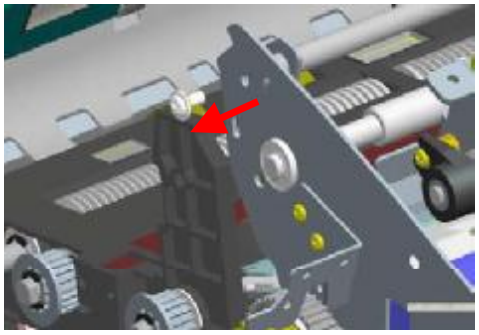
## 3.3.8 Disassemble GST Assy

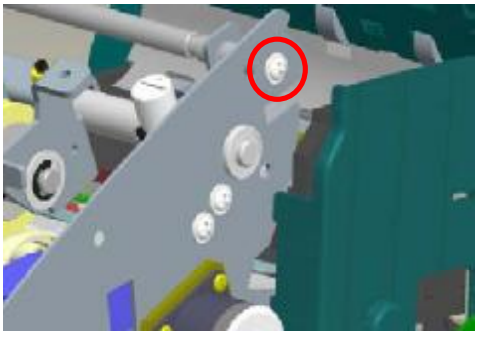
A. After removing Hopper cover and Thickness assy, you'll see the shaft that connecting to the GST Assy.

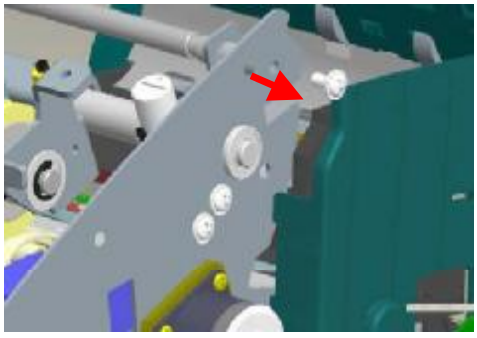


B. Unloose two bolt at both sides.

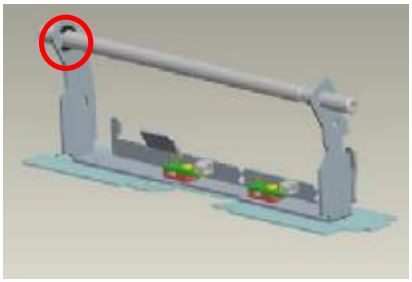


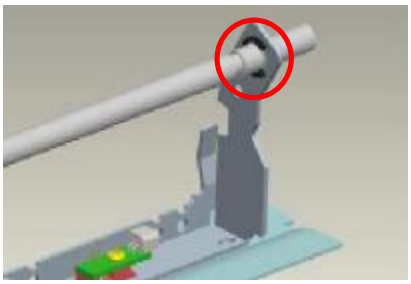


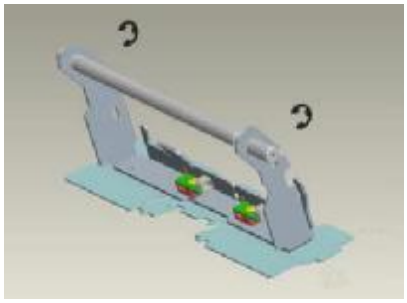




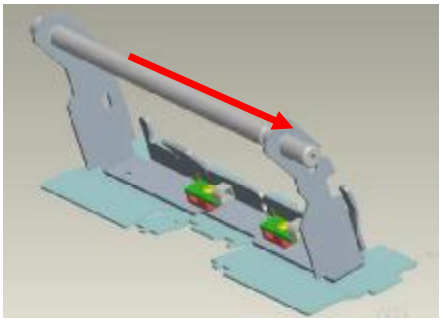
C. Remove E-rings inside of the Gst Assy.

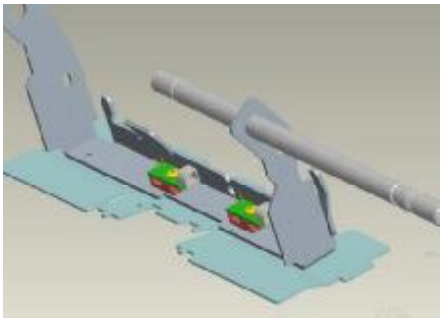




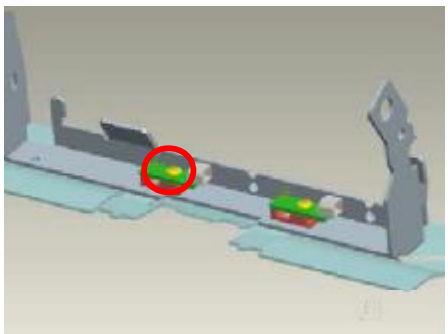


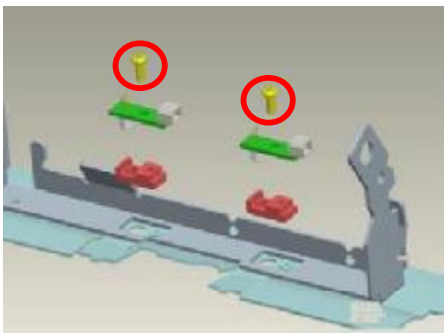
D. Slide Shaft to remove it.





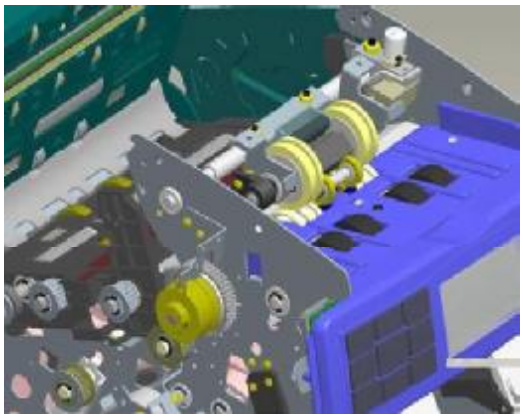
E. Unloose each bolt to disassemble the LED sensors.

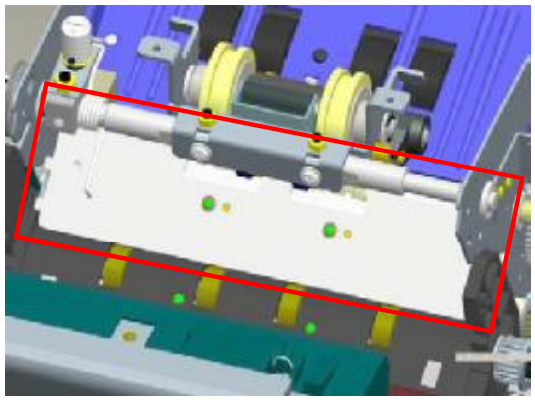




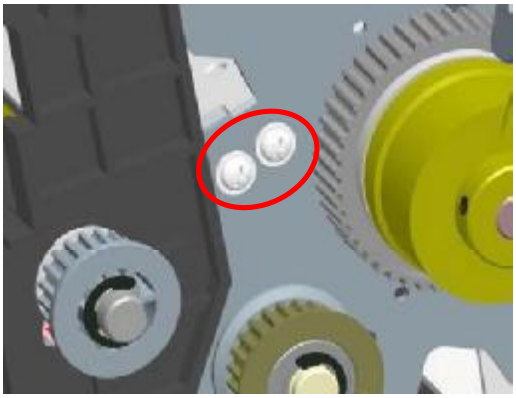
## 3.3.9 Disaseemble GSL Assy

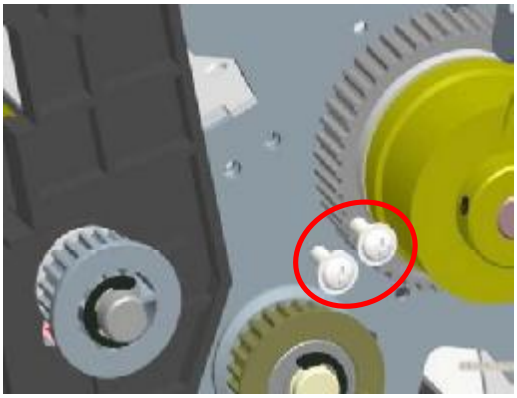
A. Afer removing Hopper cover, Thickness assy and Gst assy, you'll see GSL Assy.



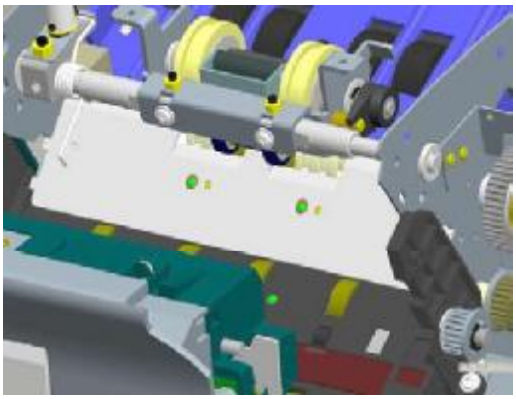


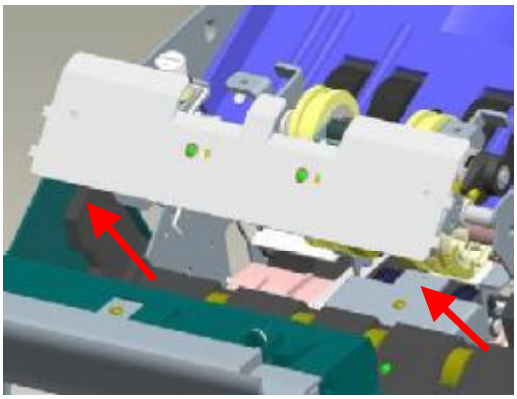
B. Unloose two bolt at both sides.



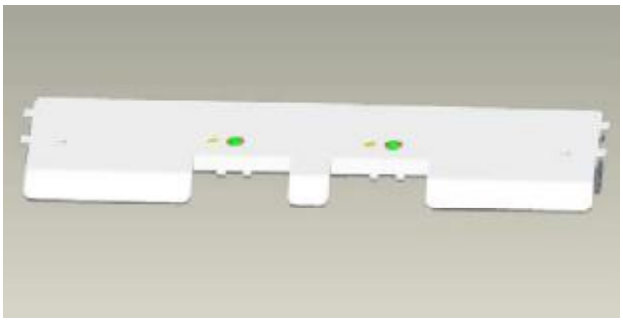


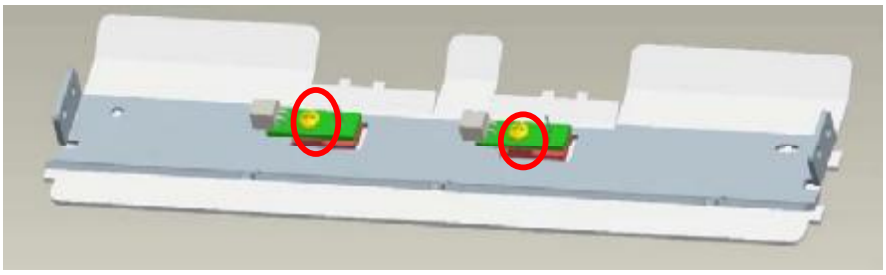
C. LIft up to remove.

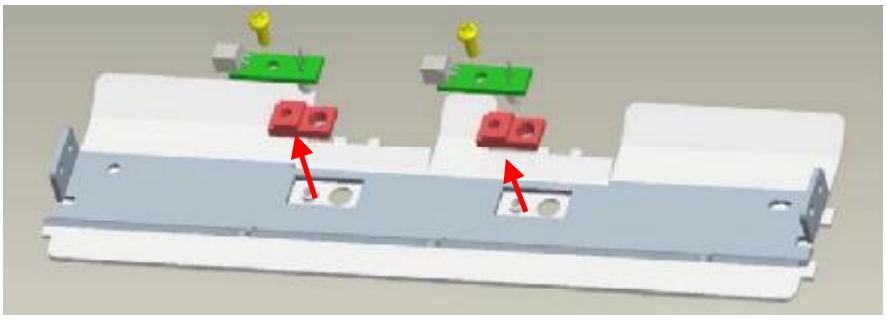




D. Unloose each bolt to disassemble the TR Sensor Assy.







## 3.4. Display Part

Display Part consists of Display Ass'y and Function Cover Ass’y.

**Display Part Contents**

| | |
|---|---|
| Display Ass'y | Display Board |
| | LCD Ass’y |
| Function Cover Ass’y | Function Cover |
| | Button |
| | Hopper Sensor PCB |

**Display Part**

### 3.4.1. Display Part

### 3.4.2. Display Ass'y과 Function Cover Ass’y

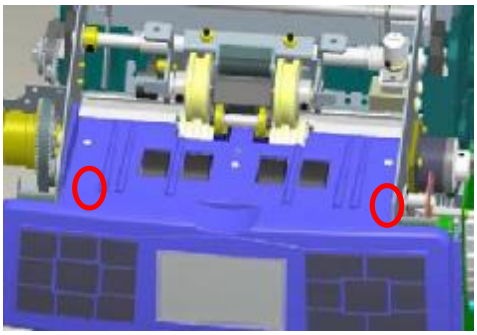
### 3.4.3. Display Ass'y

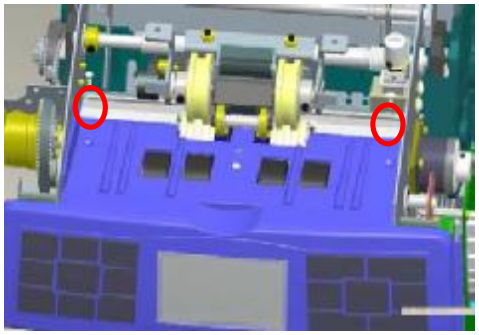
### 3.4.4. Function Cover Ass’y

## 3.4.1 Disassemble Display Part

Remove side covers first to disassemble display part.

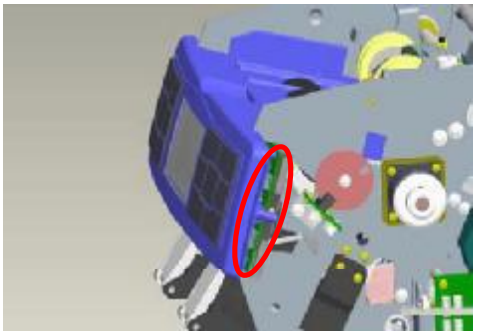
A. Unloose two bolts at the top of the dispay part.

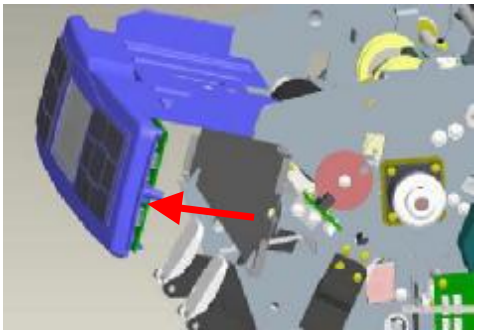


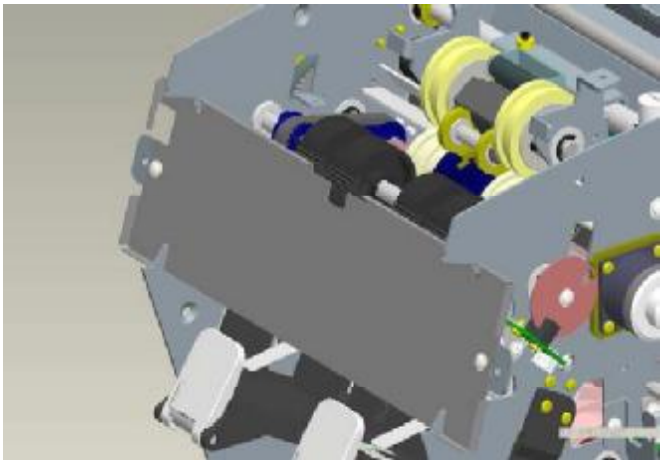


B. Unplug cables (H14, H18) from the display part.

C. Pull to remove the display part.







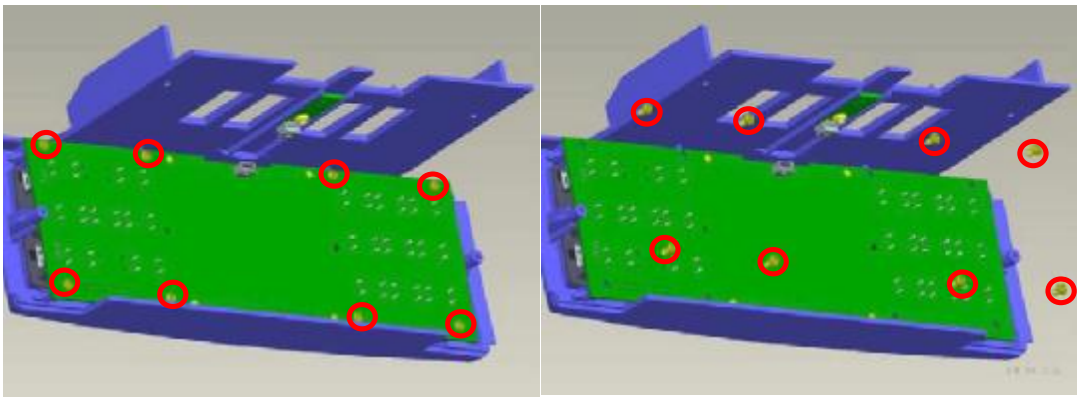
## 3.4.2 Disassemble display assy and Function cover assy

Display assy is Display board and LCD Assy.

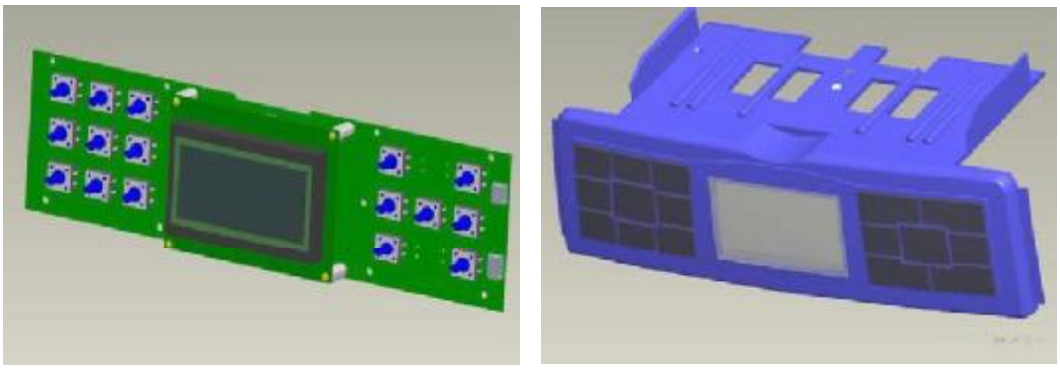
Function cover assy is function cover, button, hopper sensor.

A. unplug the cable from the board.

B. unloose 8 screws on the display board.



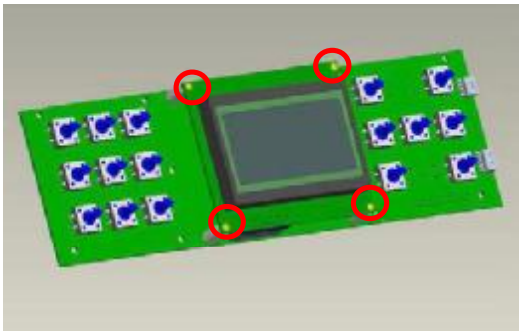
C. Display assy and Function cover assy.

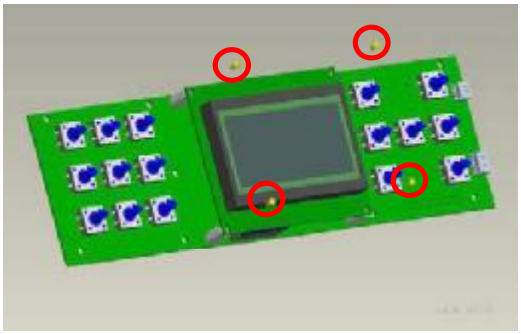


## 3.4.3 Disassemble display module

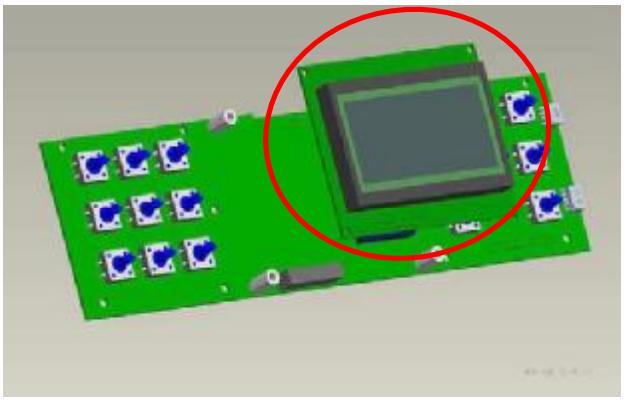
Display module is Display PCB and LCD assy.

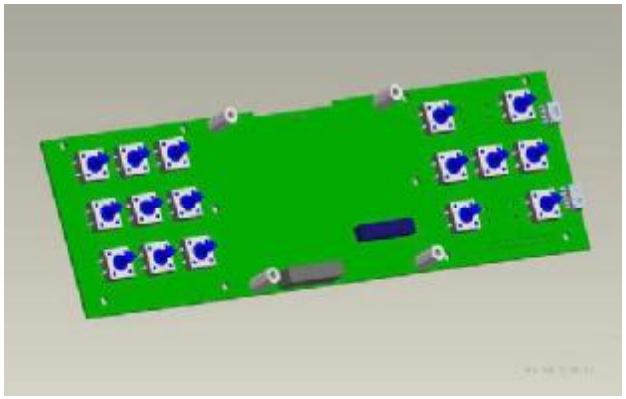
A. unloose 4 screws on the top of the display module.





B. Be careful with the connector at the bottom when you remove.

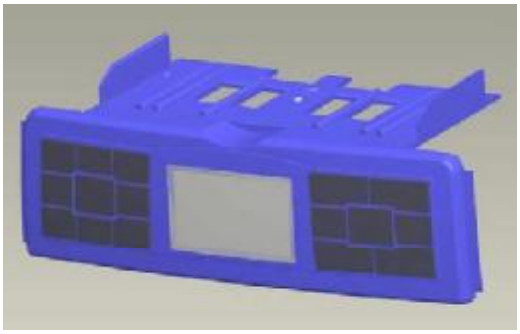


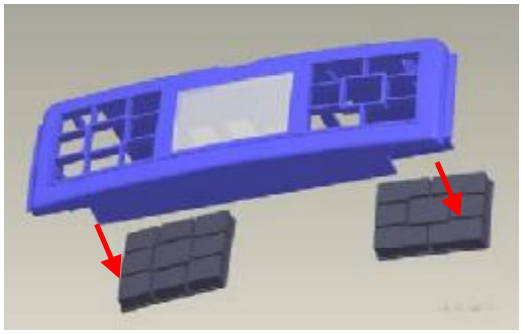


## 3.4.4 Disassemble Function cover assy

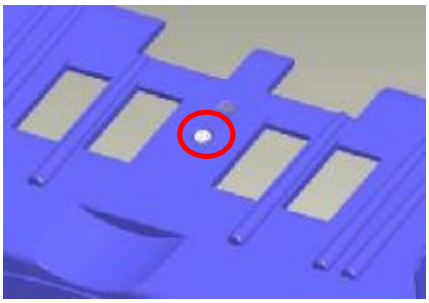
Function cover assy is function cover, buttons and hopper sensor.

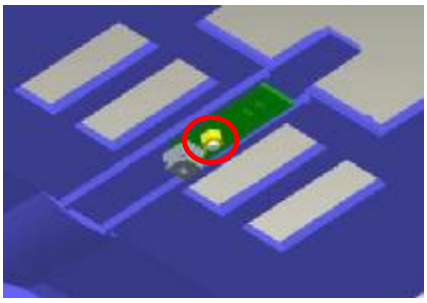
A. Simply push to remove the buttons.

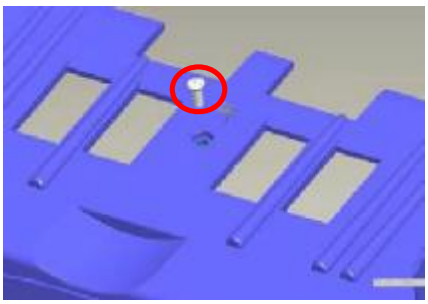


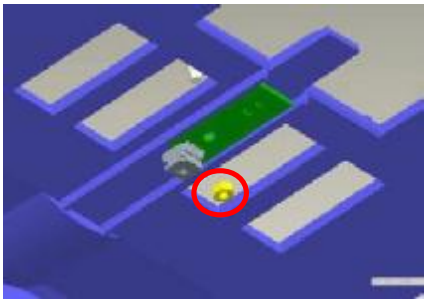


B. Unloose the bolt on the top to remove the hopper sensor.









## 3.5. Pocket Stacker

Pocket Stacker consist of  Pocket Body Ass'y, Pocket Stacker Ass'y, Pocket Roller Ass'y and Transfer Guide Ass'y.

### Reject Pocket

| Part | Ass'y |
|---|---|
| Pocket Body Ass'y | Pocket Body |
| | TR Sensor Ass'y |
| | REC Sensor Ass'y |
| Pocket Stacker Ass'y | Pocket Stacker |
| | Pocket Cover |
| Pocket Roller Ass'y | Pocket Roller |
| | Pocket Wheel Ass'y |
| Transfer Guide Ass'y | Transfer Bracket Guide |
| | Transfer Roller Ass'y |

### Pocket Stacker Contents

#### 3.5.1. Pocket Body Ass'y

#### 3.5.2. Pocket Body Ass'y and Sensor LED

#### 3.5.3. Pocket Stacker Ass'y

#### 3.5.4. Pocket Stacker, Pocket Cover

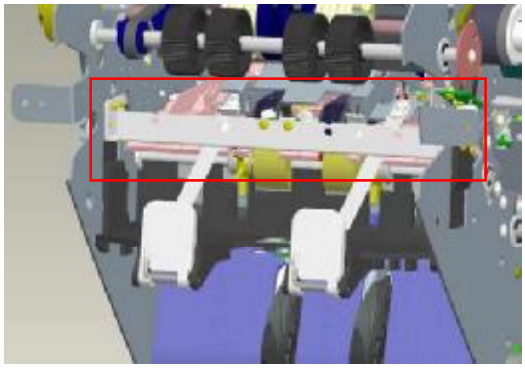
#### 3.5.5. Pocket Roller Ass'y

#### 3.5.7. Transfer Guide Ass'y

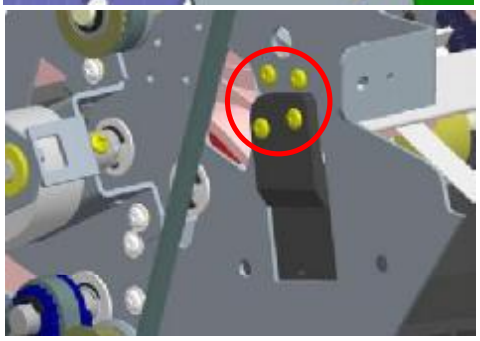
## 3.5.1 Disassemble Pocket Body assy

Remove side covers and display part first.

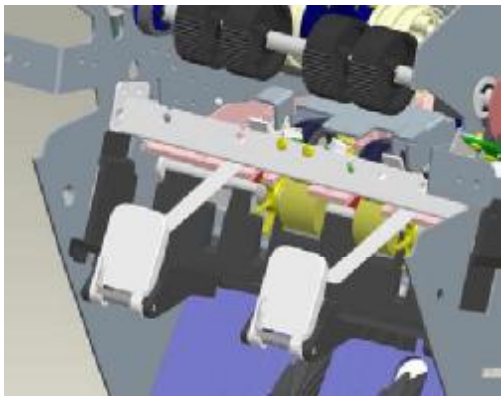
A. Reject Pocket Body assy



B. Unloose the 8 screws on the side frame.



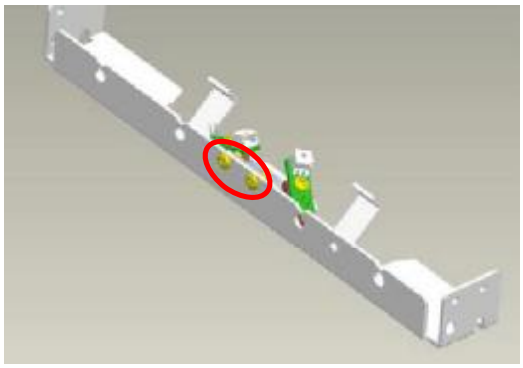
C. Be careful with wires connect to each board.

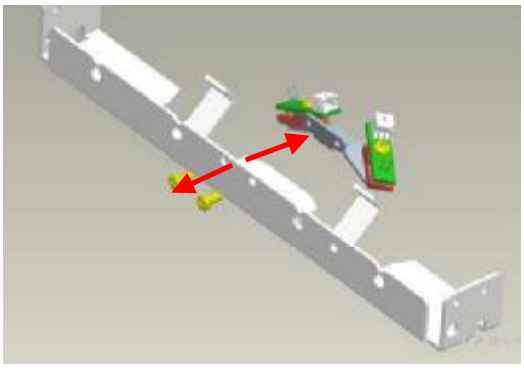


## 3.5.2 Disassemble Pocket body Assy and Sensor Led

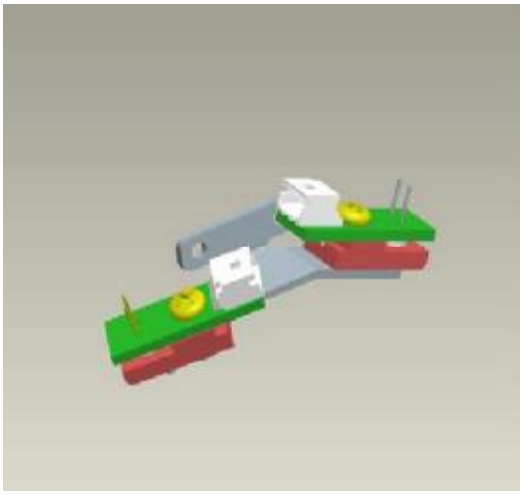
Pocket Body Ass'y consist of Pocket Body Body and Reject Sensor Ass'y.

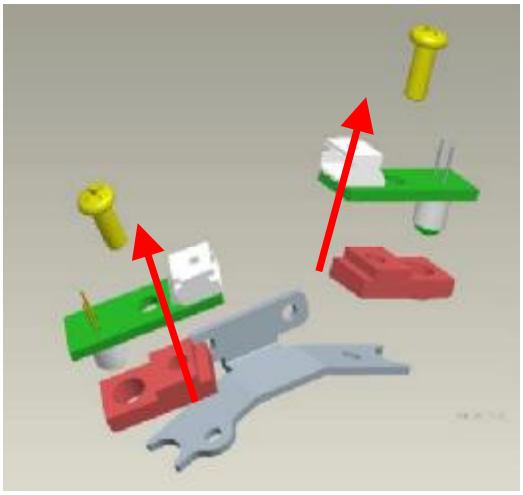
A. Unloose two screws on the reject sensor assy.





B. Unloose the screw to serate reject sensor.

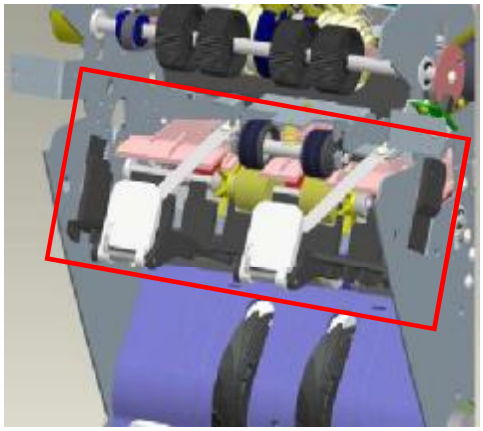


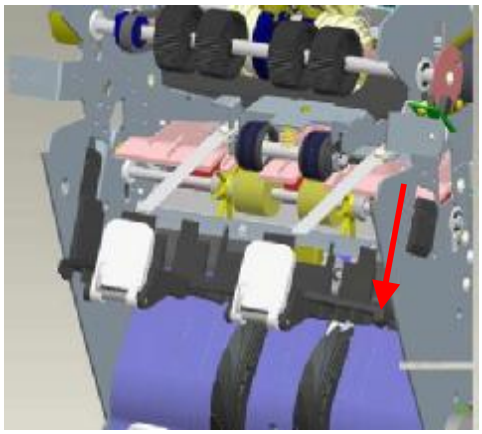


## 3.5.3 Disassemble Pocket Stacker Assy

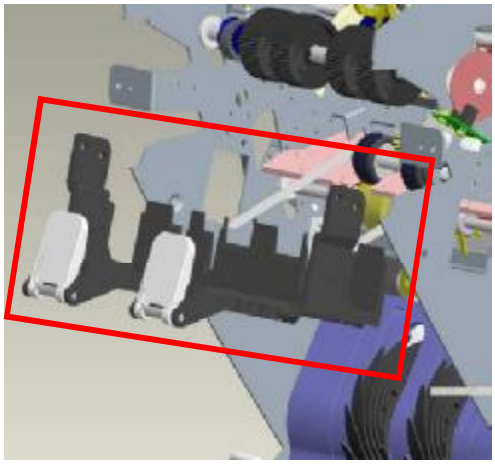
Pocket Stacker Ass'y consist of Pocket Stacker, Pocket Cover.

A. push the sides of the Pocket Stacker assy.



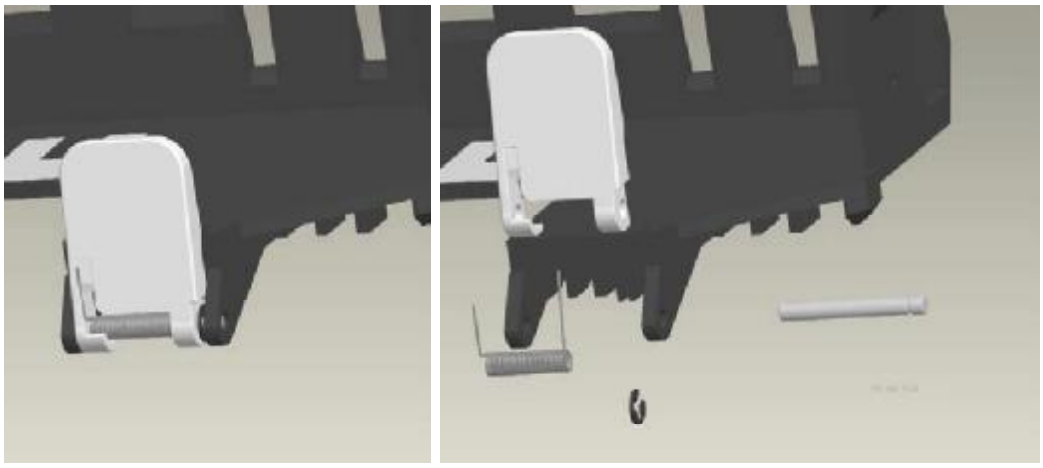


B. Pull downward to remove it.



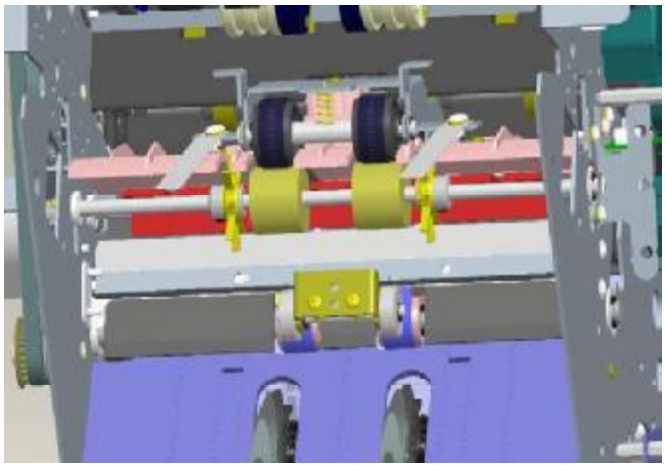
## 3.5.4 Disassemble Pocket stacker and Pocket cover

A. Remove E-ring to separate pocket cover from the pocket stacker.

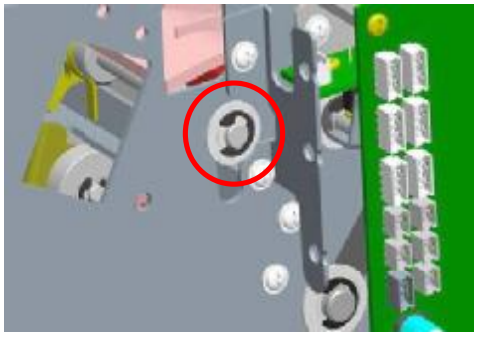


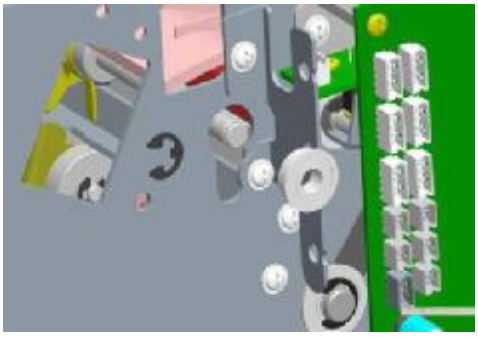
## 3.5.5 Disassemble Pocket Roller Assy

A. Pocket Roller Assy

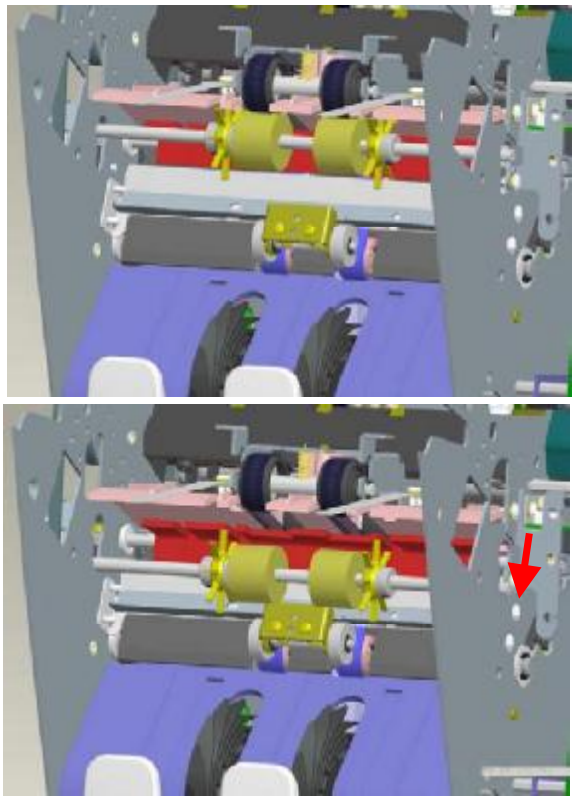


B. Remove the E-ring at the sides of the Pocket Roller Assy

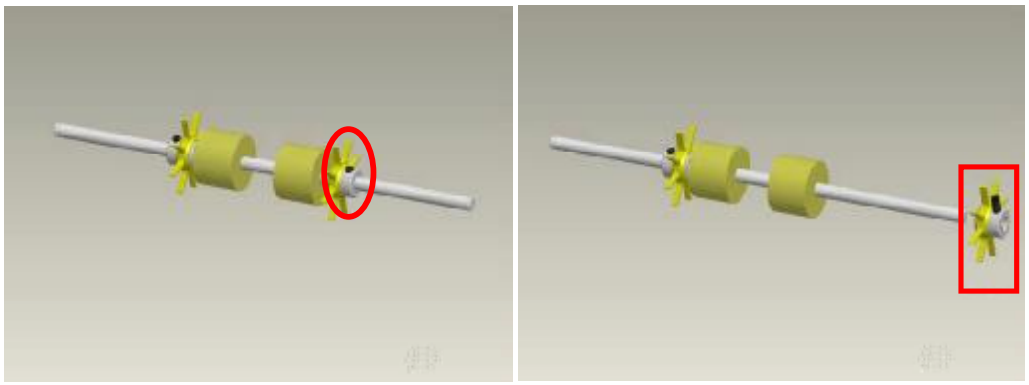




C. Pull downward to unlock and remove it.



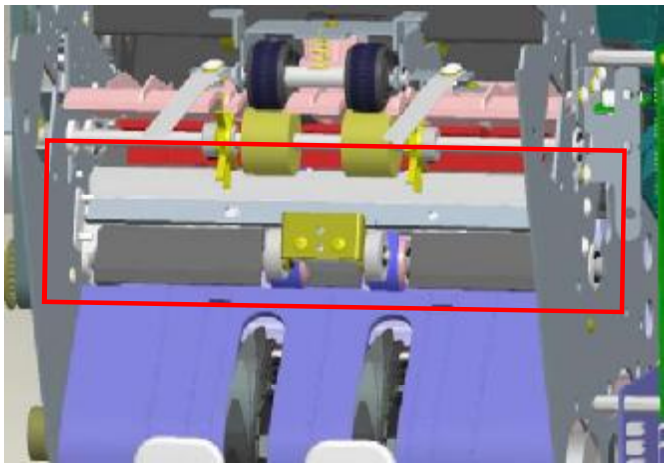
D. Unloose stripper bolt in the pocket wheel to remove it.



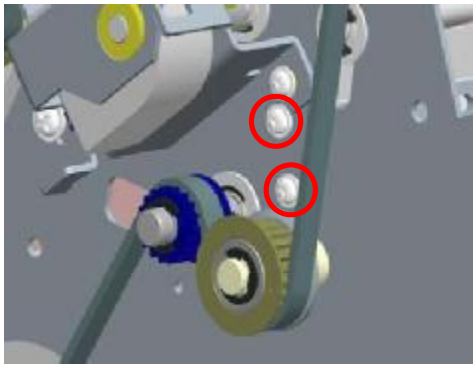
## 3.5.7 Disassemble Transfer guid assy

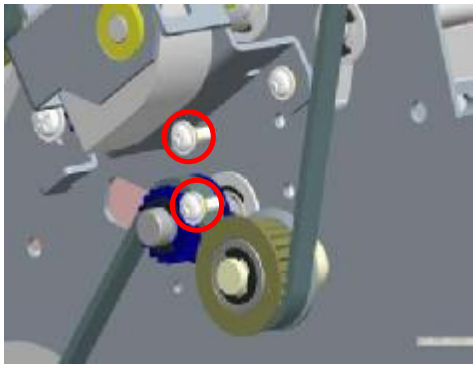
remove pocket pocket first to disassemble transfer guide assy.

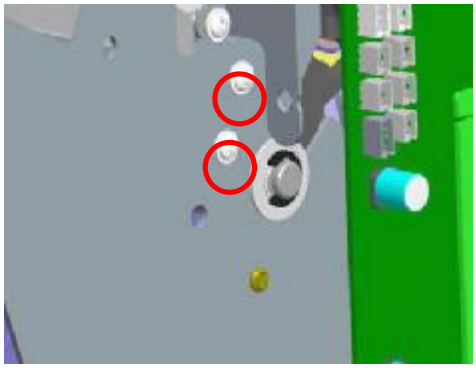
A. Transfer guide assy

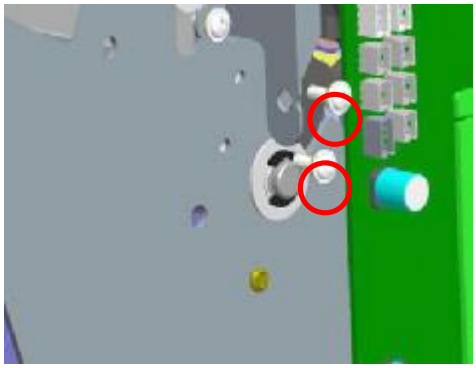


B. Unloose the 4 crews at sides of the frame to remove transfer guide assy.

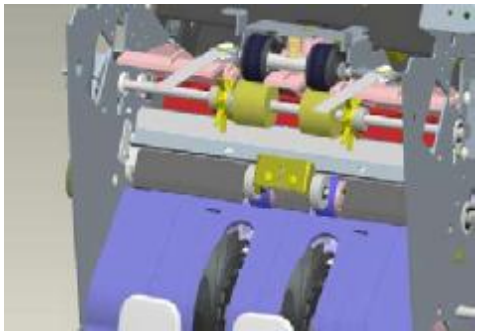


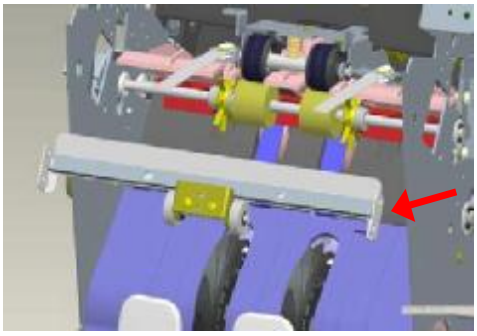




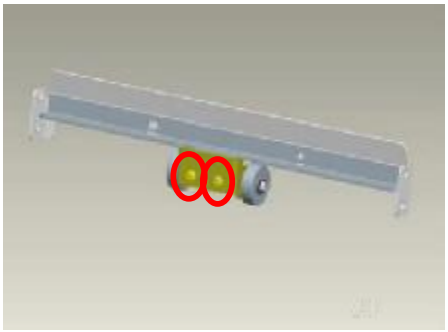


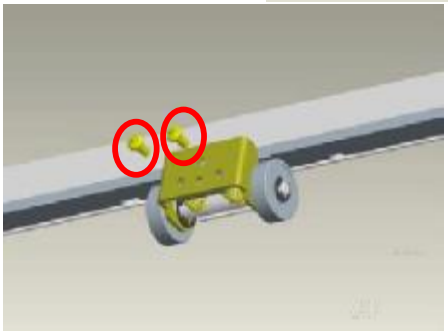
C. pull to remove it.

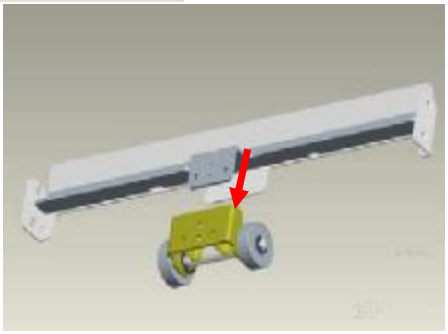




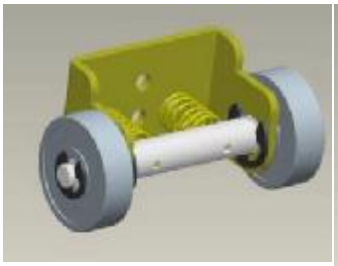
D. Unloose the 2 screws on the transfer guide rollers assy to separte fromt the transfer guide.

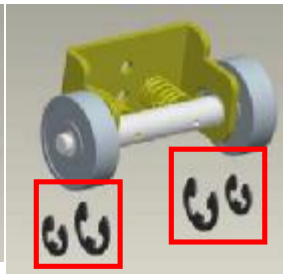






E. Remove E-rings to serate the bearing from the shaft.





## 3.6. Stacker

Stacker Part consists of Stacker Guide Ass'y and Stacker Wheel Ass'y.

**Stacker**

| Part | Ass'y |
|---|---|
| Stacker Guide Ass'y | Stacker Guide |
| | Stacker Sensor Ass'y |
| Stacket Wheel Ass'y | Stacket Wheel Ass'y |
| | Stacket Wheel Arm |
| | Stacket Motor |

**Stacker Contents**


### 3.6.1. Stacker Guide Ass'y

### 3.6.2. Stacker Guide and Stacker sensor Ass'y

### 3.6.3. Stacket Wheel Ass'y

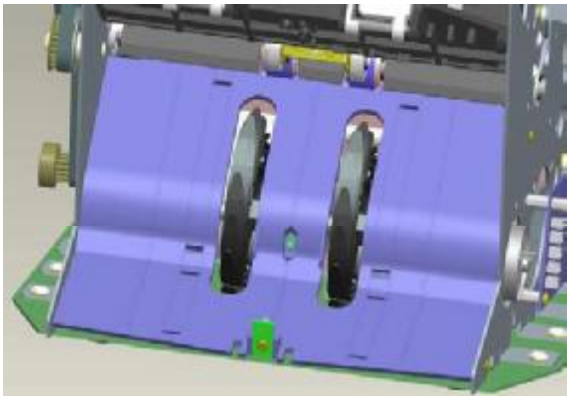
### 3.6.4. Spool Wheel Ass'y

### 3.6.5. Stacket Motor

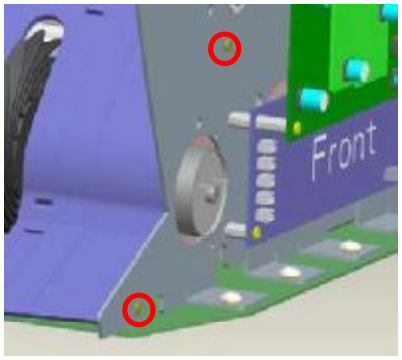
## 3.6.1 Disassemble Stacker guide assy

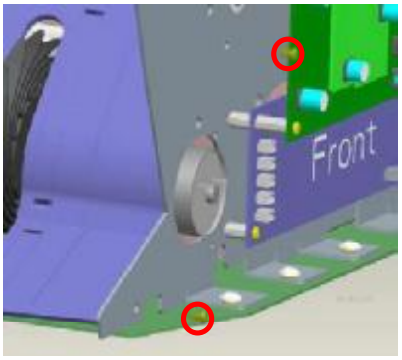
Remove side covers and stacker cover first before you disassemble the stacker guide assy.

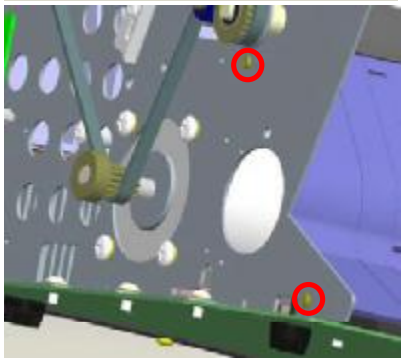
A. Stacker guide assy

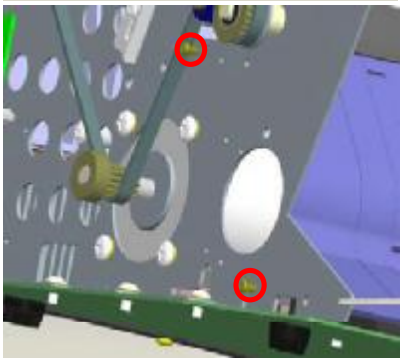


B. Unloose the 4 screws on the frame to remove stacker guide assy.

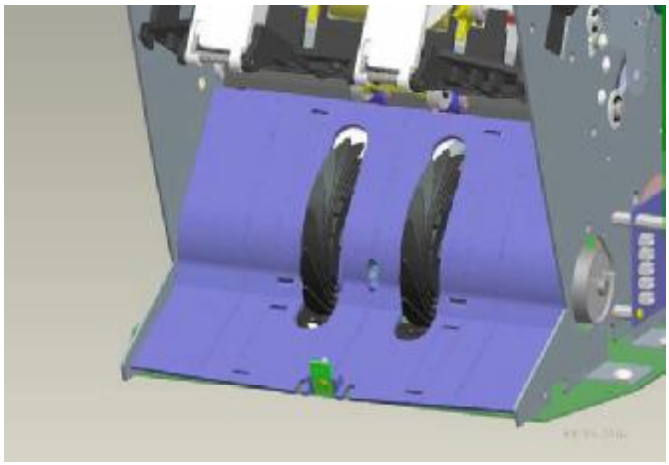


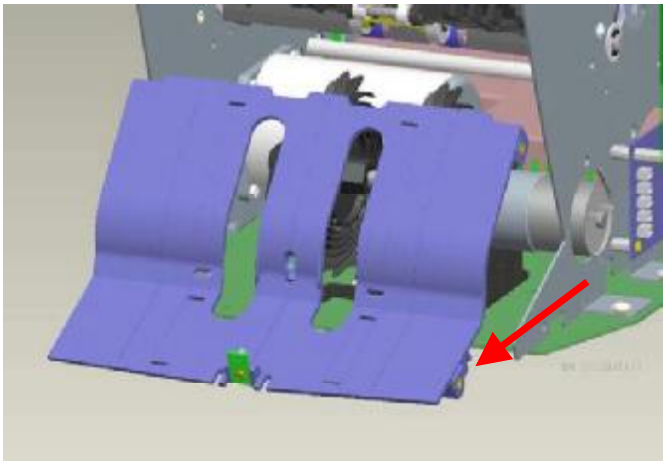



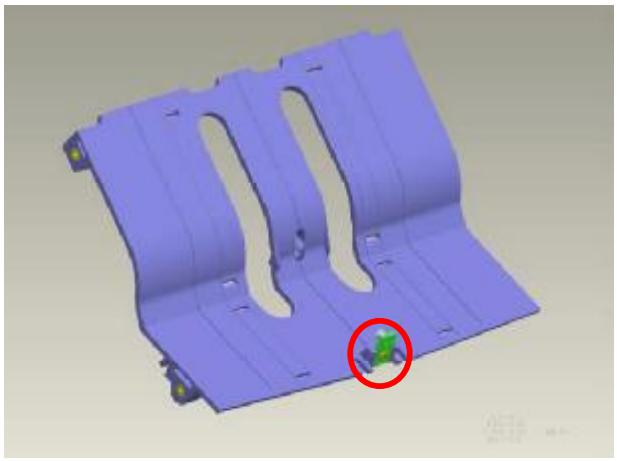


C. Lift and Pull forward to remove it.

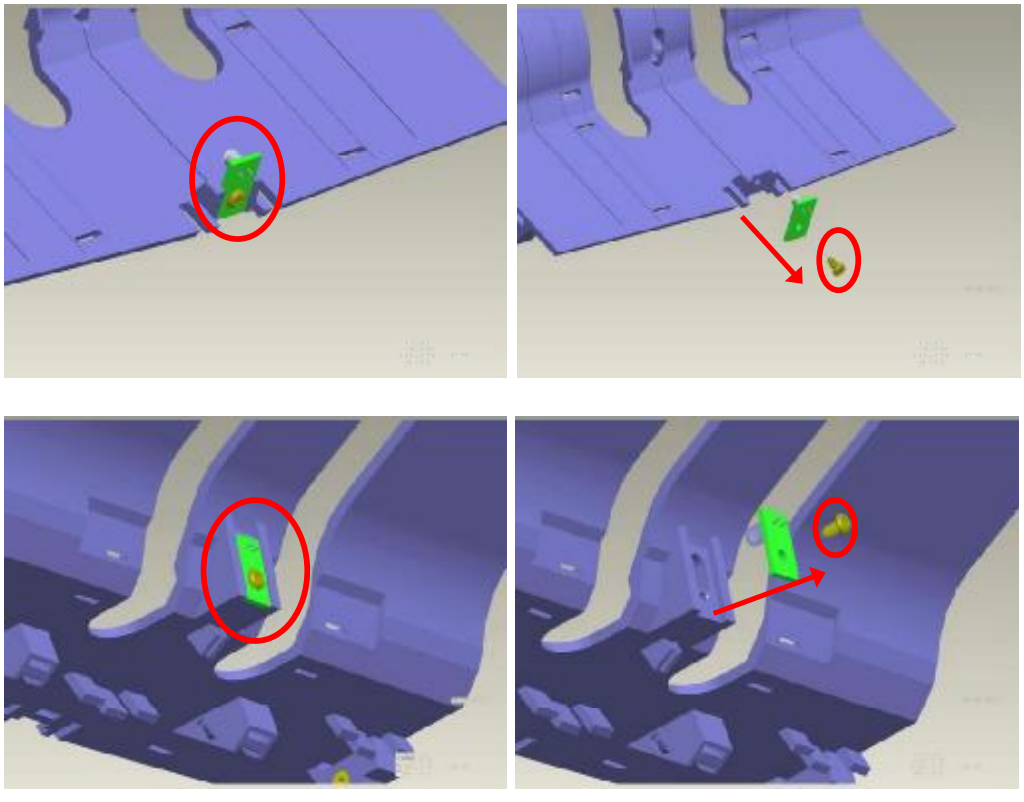




## 3.6.2 Disassemble Stacker guide and Stacker sensor assy

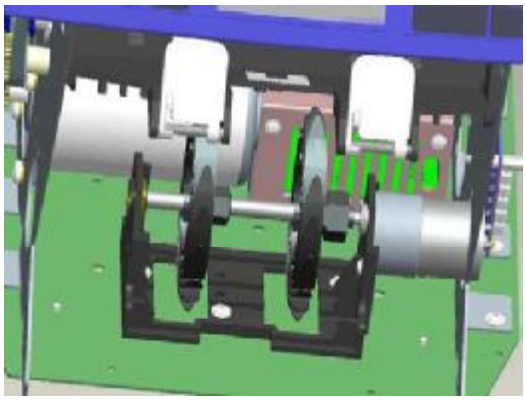


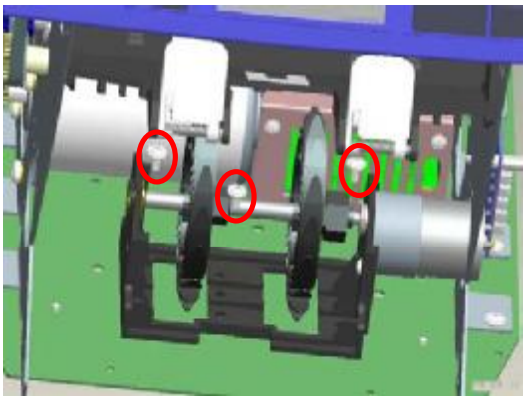
A. Unloose the screw on the sensor to replace it.



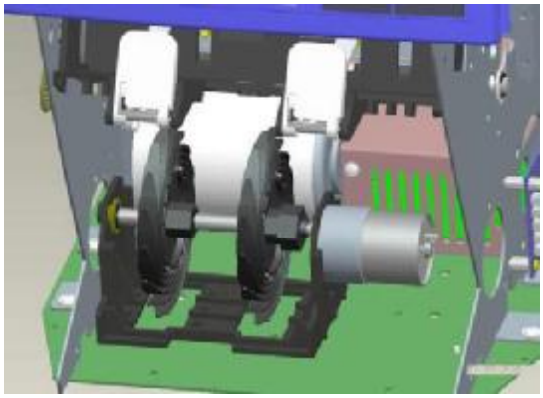
## 3.6.3 Disassemble Stacker wheel assy

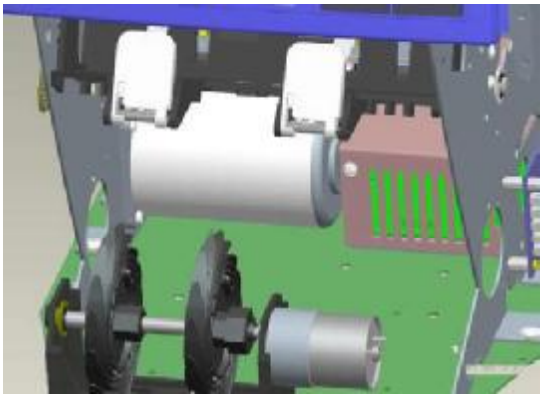
A. Unloose the 3 screw on the bottom frame to remove stacker wheel assy.





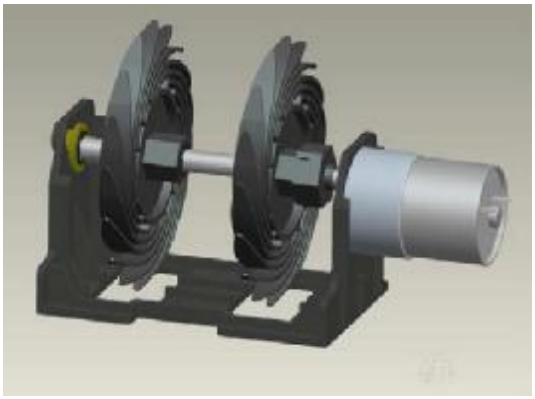
B. Slide left side and lift it.



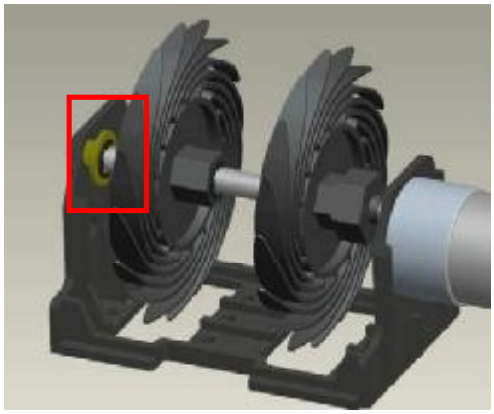


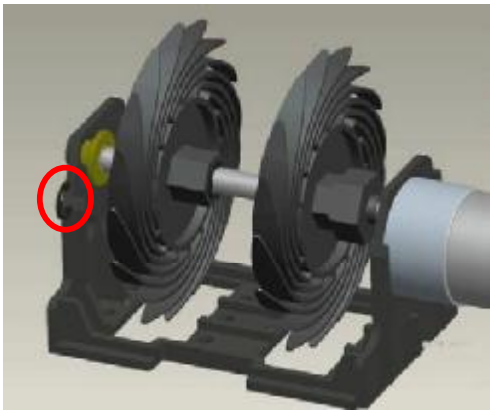
## 3.6.4. Disassemble Stacker Wheel Arm and Stacker Wheel Assy

A. Stacker wheel assy

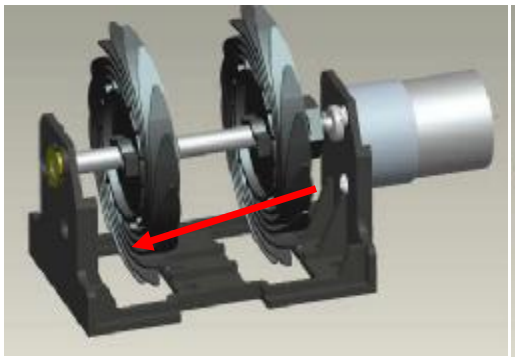


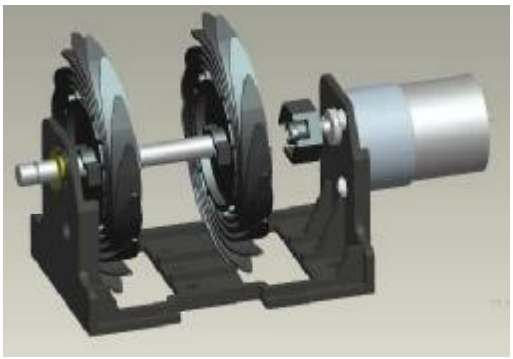
B. Remove E-ring on the frame.



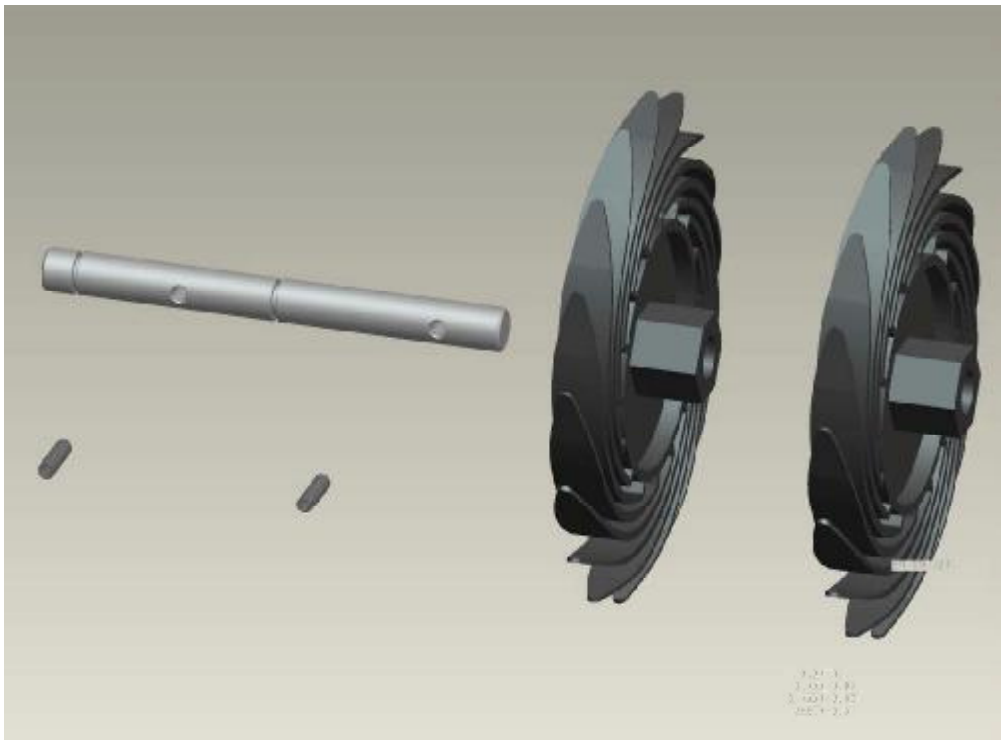


C. Slide left to remove stacker wheel.





D. Remove E-ring to serate stacker wheel from the shaft.



## 3.7. GCT Ass'y

GCT Ass'y consists of GCT Board, UV Sensor, LED Sensor Ass'y, Reflect CIS(Contact Image Sensor), Lock Shaft, GCT Shaft-A Ass'y, GCT Shaft-B Ass'y, GCT Guide, CIS LED PCB, Glass Plate and Acrylic Plate.

**GCT Ass'y**

| Part | Ass'y |
|---|---|
| GCT Board | |
| MG Sensor | MG Center Sensor Ass'y |
| | MG Left Sensor PCB |
| | MG Right Sensor PCB |
| UV Sensor | REF UV Ass'y |
| | TRANS UV Ass'y |
| CIS LED PCB | |
| Reflect CIS(Contact Image Sensor) | |
| GCT Lock Shaft | |
| GCT Shaft-A Ass'y | Spring Cap |
| | GCT Spring |
| | GCT Shaft-A |
| GCT Shaft-B Ass'y | Spring Cap |
| | GCT Spring |
| | GCT Shaft-B |
| LED Sesnor Ass'y | |
| GCT Guide | |
| Glass Plate | |
| Acrylic Plate | |

## GCT Ass'y Contents

**3.7.1. CIS Ass'y**

**3.7.2. GCT Board**

**3.7.3. MG Sensor**

**3.7.4. UV Sensor**

**3.7.5. CIS LED PCB**

**3.7.6. CIS(Contact Image Sensor)**

**3.7.7. GCT Lock Shaft**

**3.7.8. GCT Shaft-A Ass'y, GCT Shaft-B Ass'y**

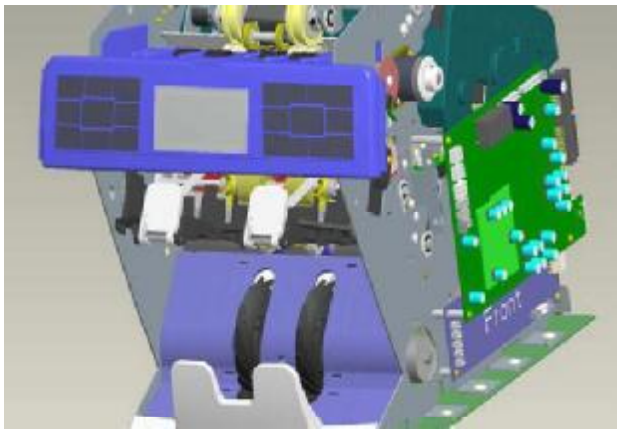
**3.7.9. LED Sensor Ass'y**

**3.7.10. GCT Guide**

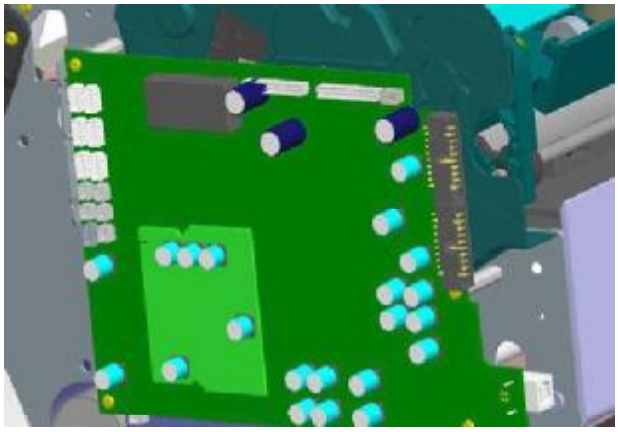
**3.7.11. Glass Plate, Acrylic Plate**

## 3.7.1 Disassemble CIS assy

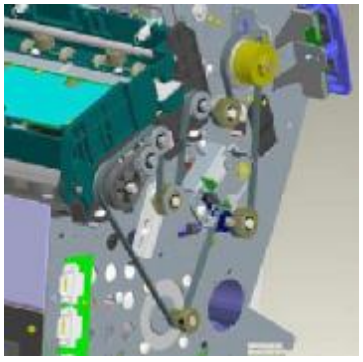
A. Remove Hopper cover, side covers first before you disassemble the CIS assy.

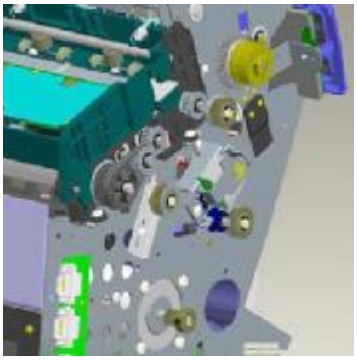



B. Unplug all cable from the board.

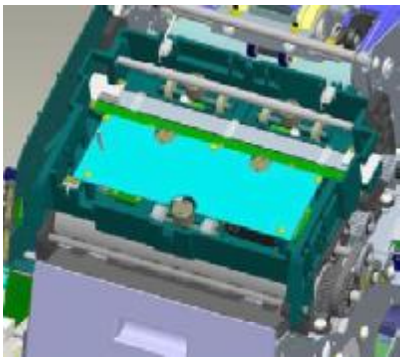


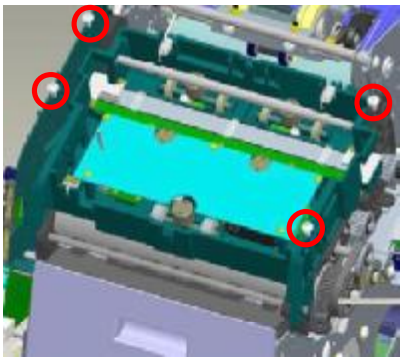
C. Remove belt guide bracket to remove the belt.



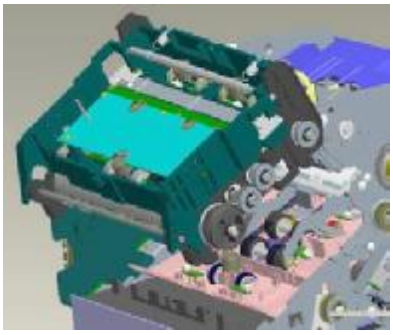


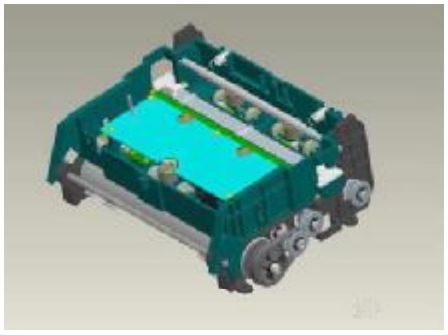
D. Unloose the 4 screws that support CIS assy to the frame.



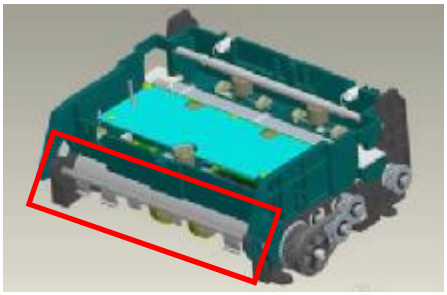


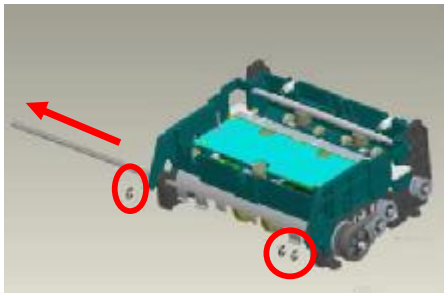
E. remove CIS assy



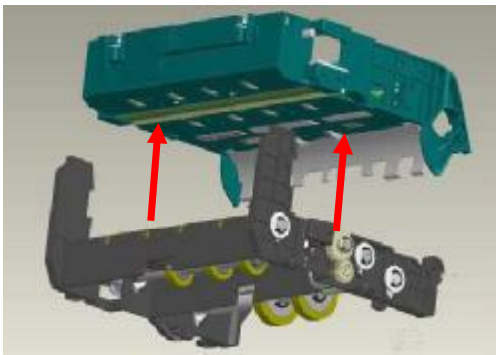


F. Remove the 3 E-rings before you remove the rotation shaft.



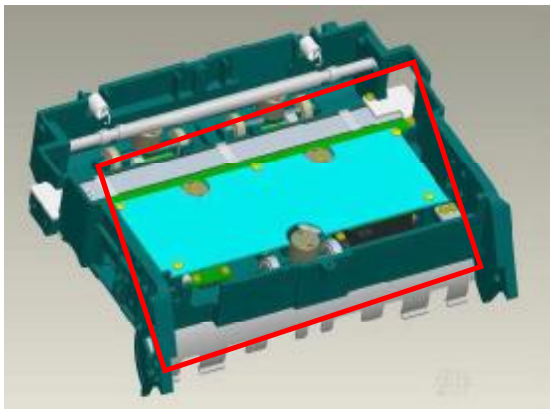


G. Pull the rotation shaft to separate GCT assy from GCL assy.

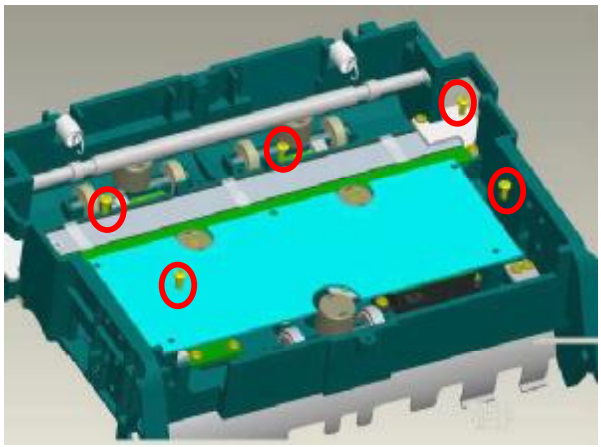


## 3.7.2 Disassemble GCT Board

A. GCT board on the top.



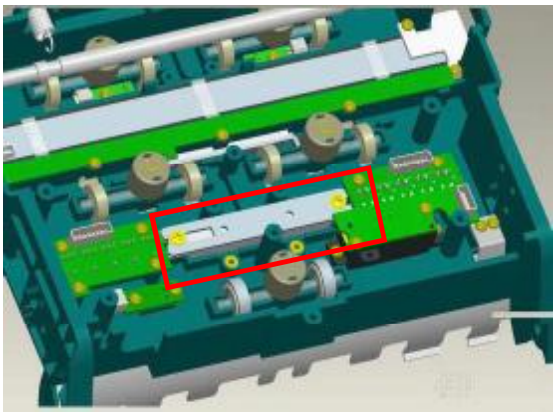
B. Unloose the 5 screws from the board.



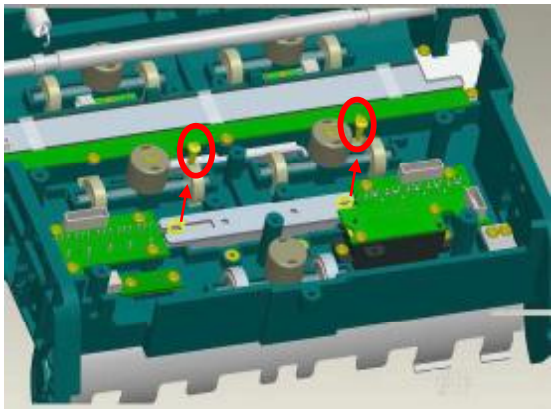
C. Remove the GCT board.

## 3.7.3 Disassemble MG sensor

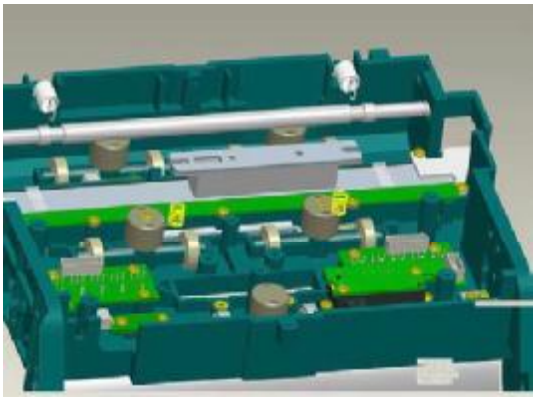
A. MG-63 sensor



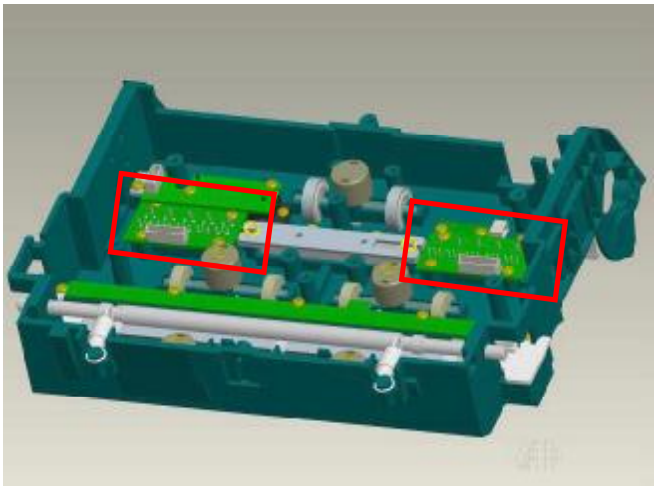
B. Unloose the 2 screw at the top.



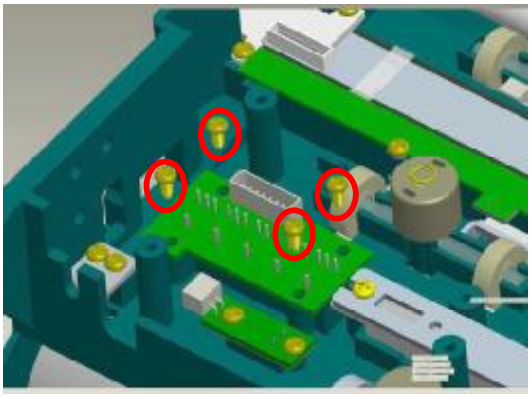
C. Remove MG-63 sensor.

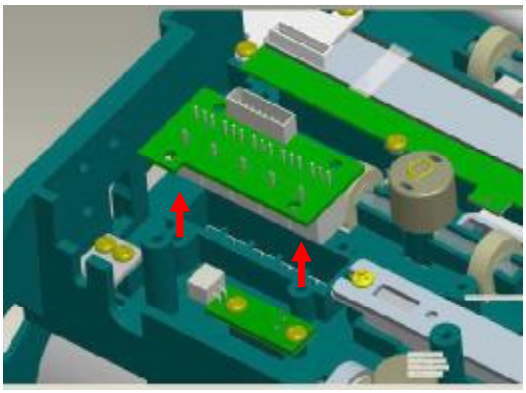


D. MG left sensor and MG righr sensor.



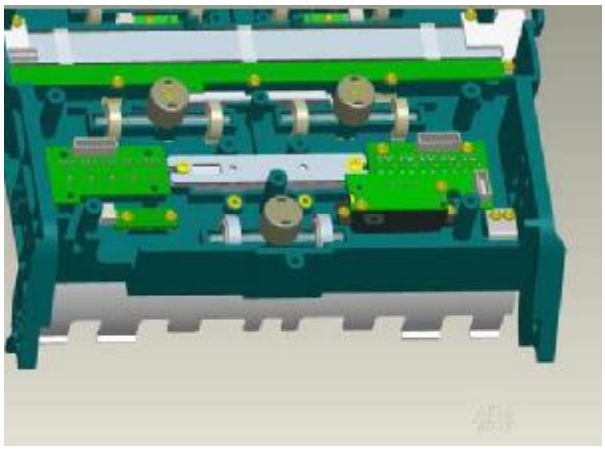
E. Unloose the screws to remove the sensors.



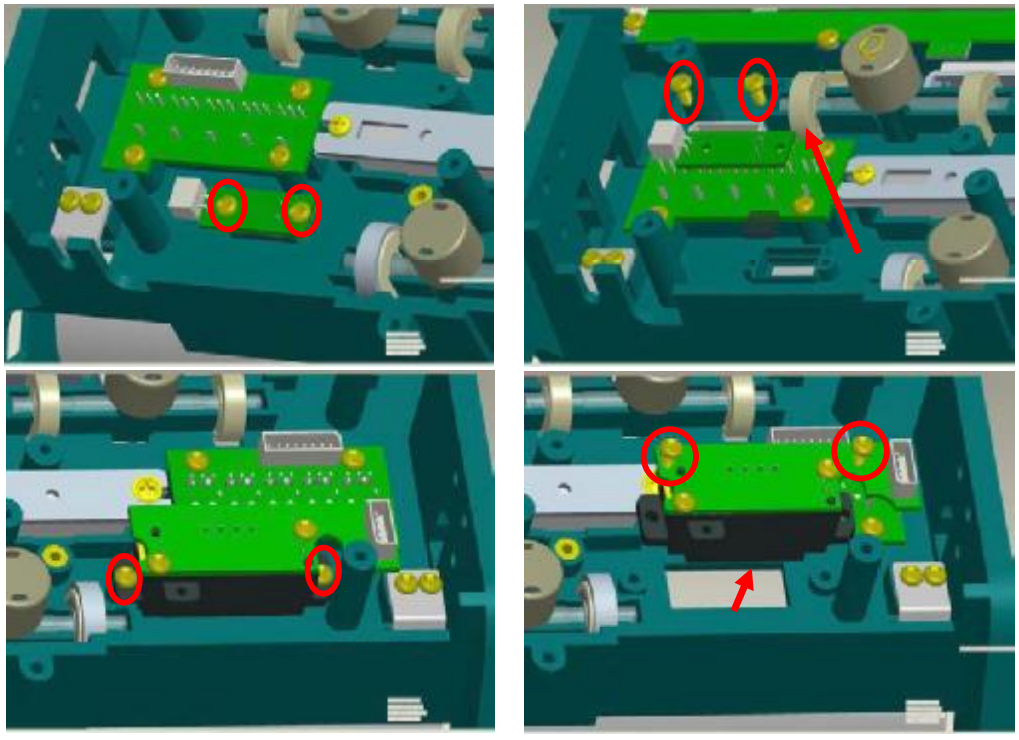


## 3.7.4 Disassemble UV sensor

A. Remove GCT board before you proceed.

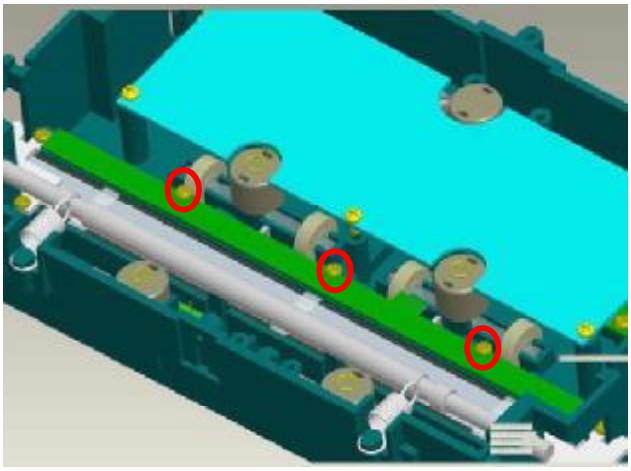


B. Unloose the screws to remove UV sensors.

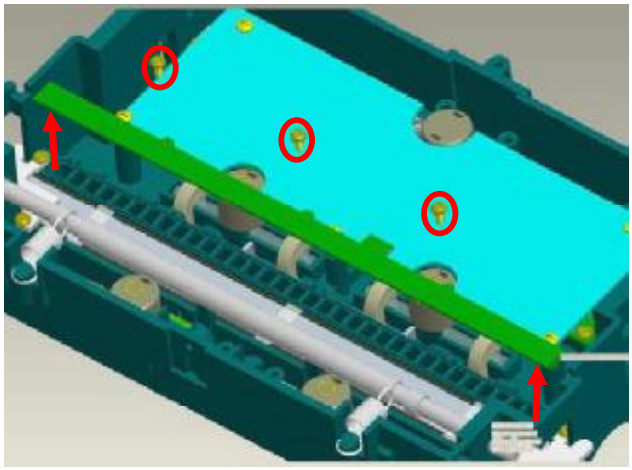


## 3.7.5 Disassemble CIS LED PCB

A. Unloose the 3 screws on the CIS LED PCB.

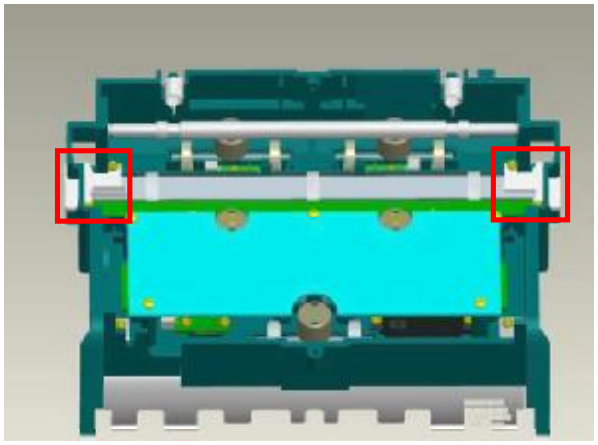


B. Lift up to remove form the GCT Assy.

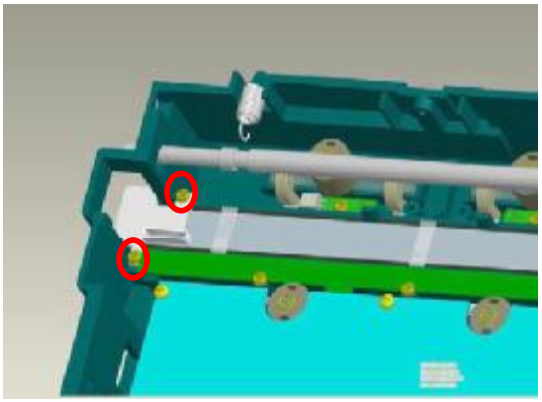


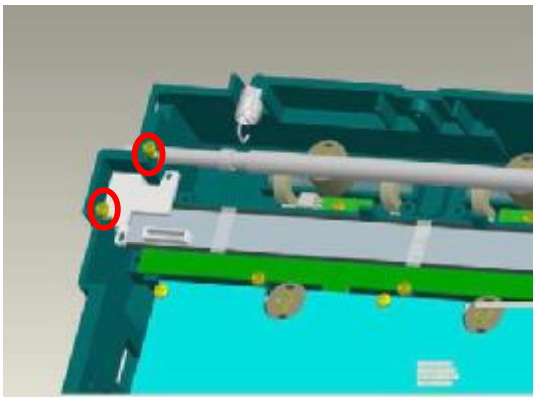
## 3.7.6 Disassemble Refelct CIS

A. you have remove two CIS brackets.

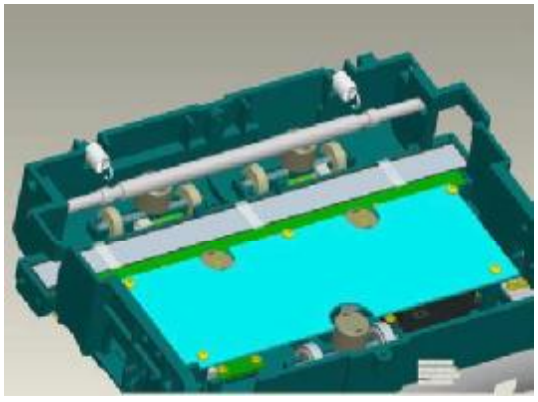


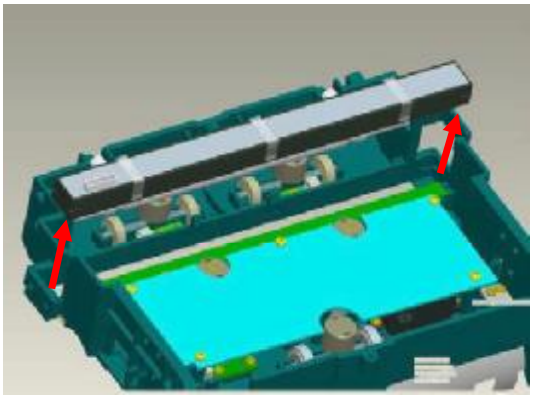
B. Unloose the 2 screws on the bracket.



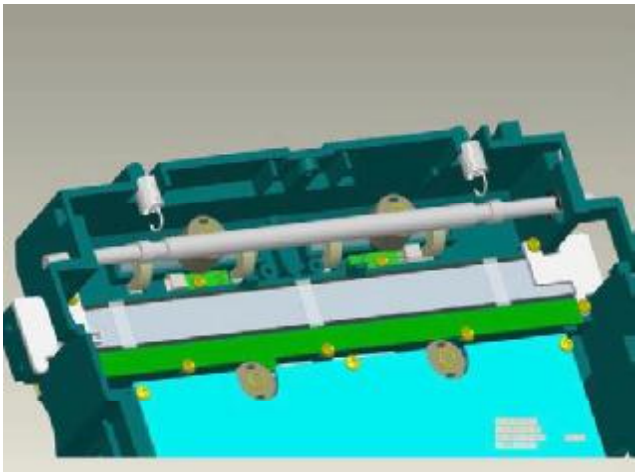


C. Lift up to remove from Upper Discrimination Module.

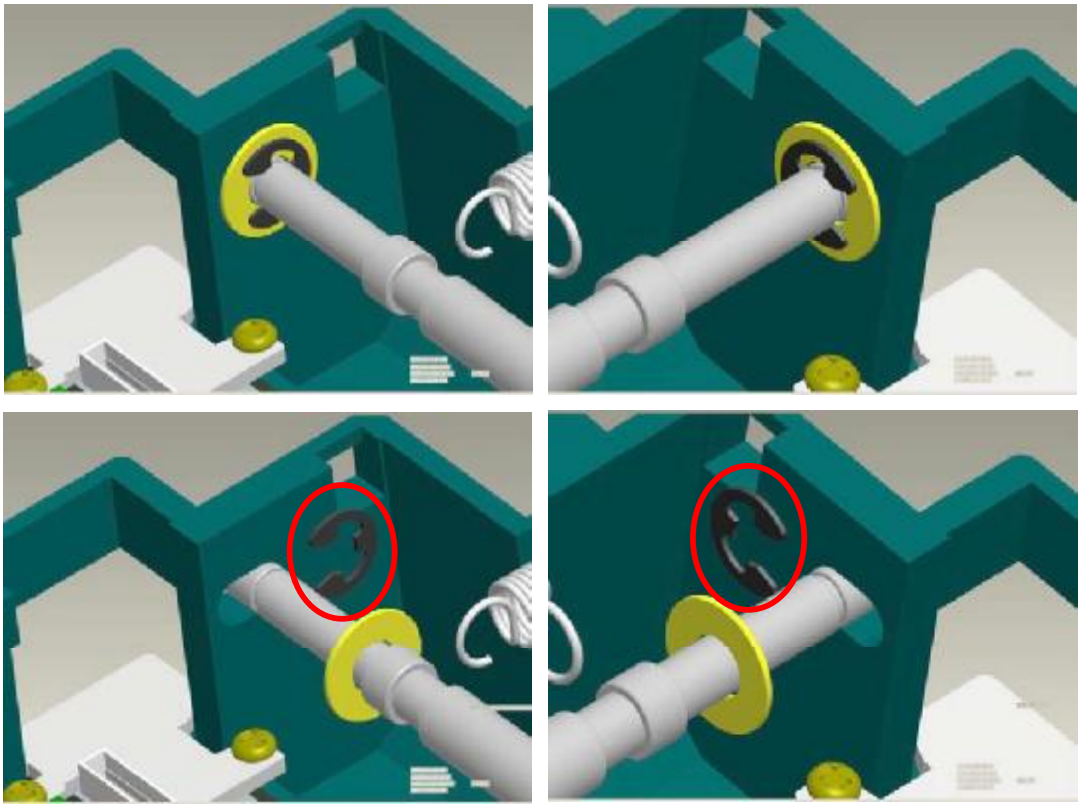




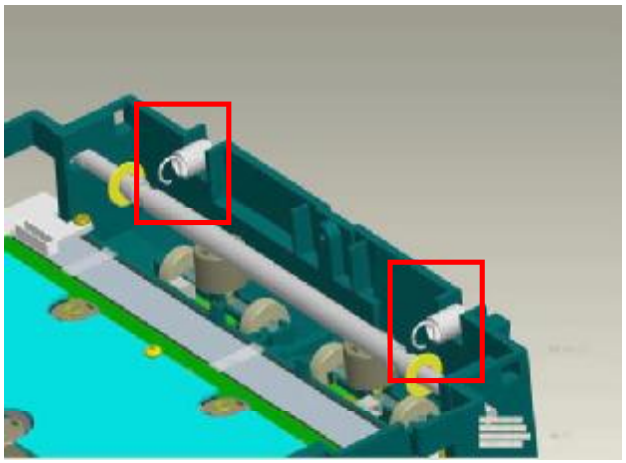
## 3.7.7 Disassemble GCT Lock Shaft

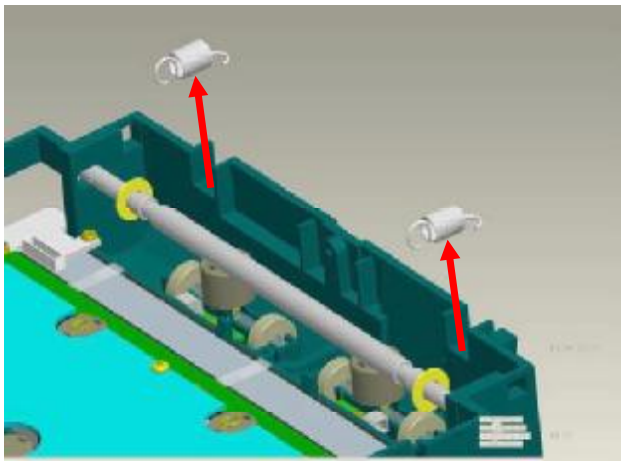


A. Remove the E-rings at the sides of the shaft.



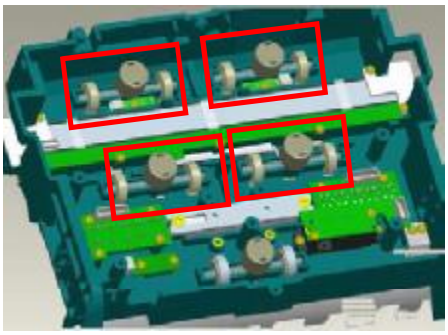
B. Remove the GCT Lock springs from the shaft.



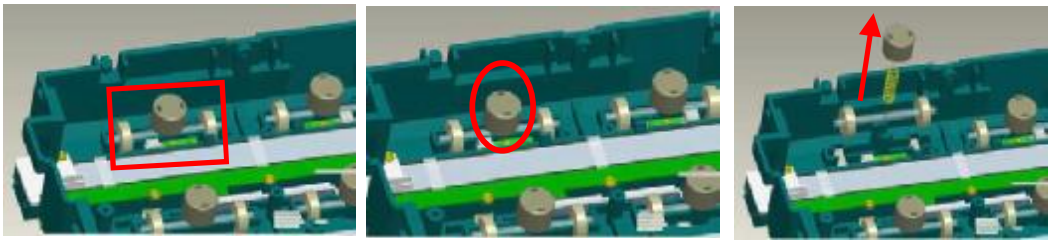


## 3.7.8 Disassemble GCT shaft-A assy, GCT Shaft-B assy

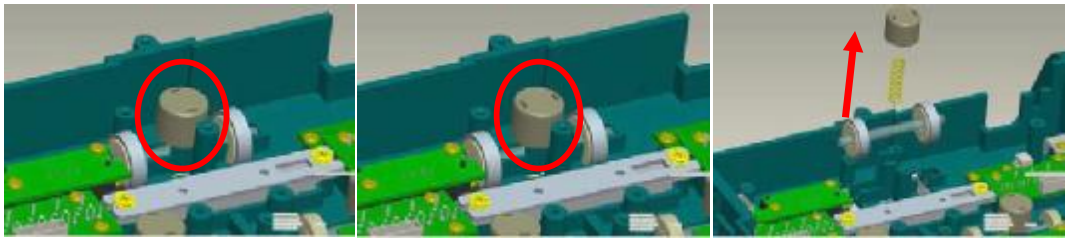
A. There are 4 GCT Shaft-A Ass'y.

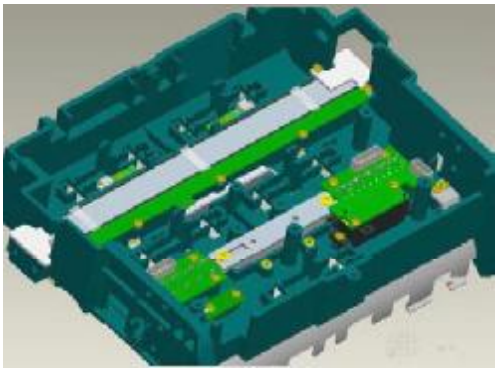


B. Push the cab and turn right or left to remove it.



C. Push and turn GCT Shaft-B.

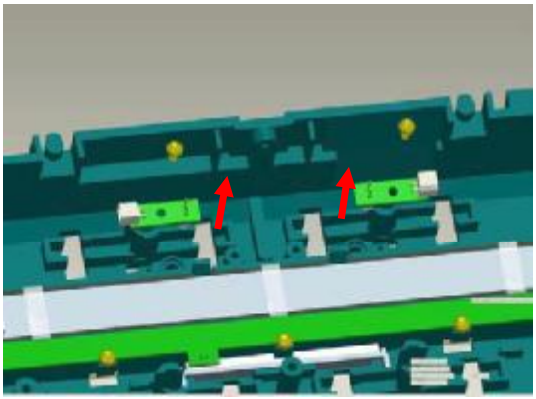




## 3.7.9 Disassemble LED sensor Assy

A. Remove the GCT shaft-A assy first before you proceed.

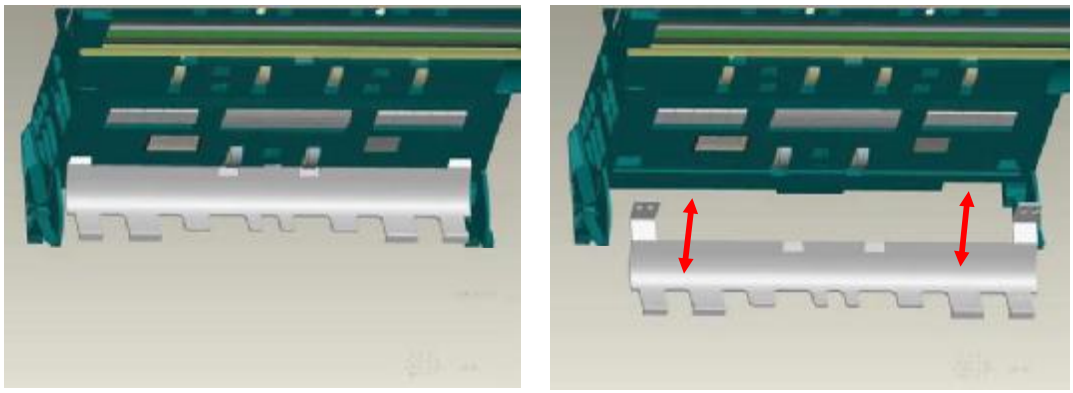
B. Unloose the bolt to remove the LED sensor assy.



## 3.7.10 Disassemble GCT guide

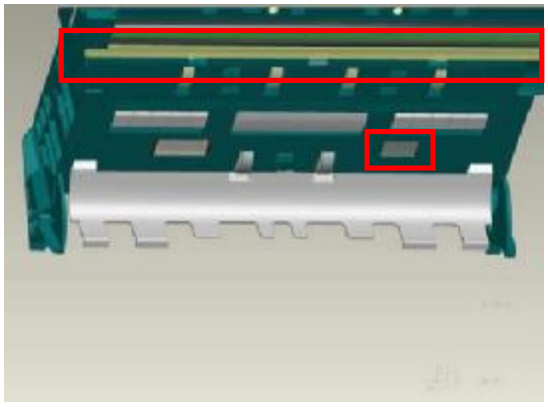
A. Unloose the 2 screw on the guide guide.

B. Pull down to remove.

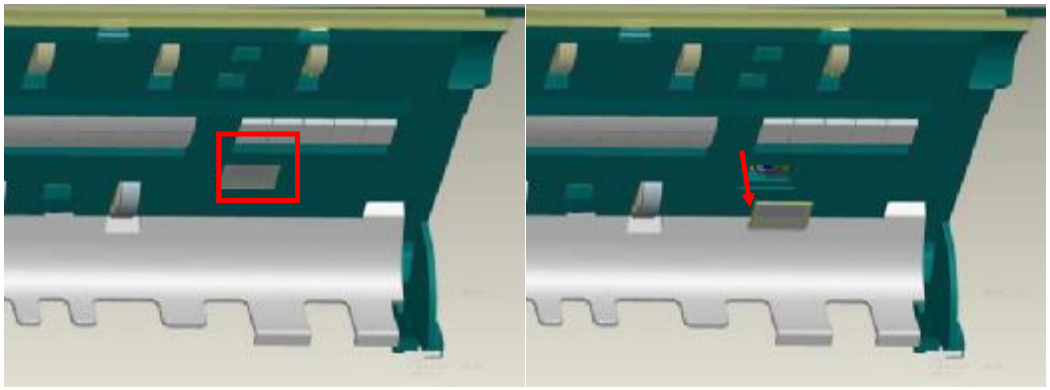


## 3.7.11 Disassemble Glass plate and acrylic plate

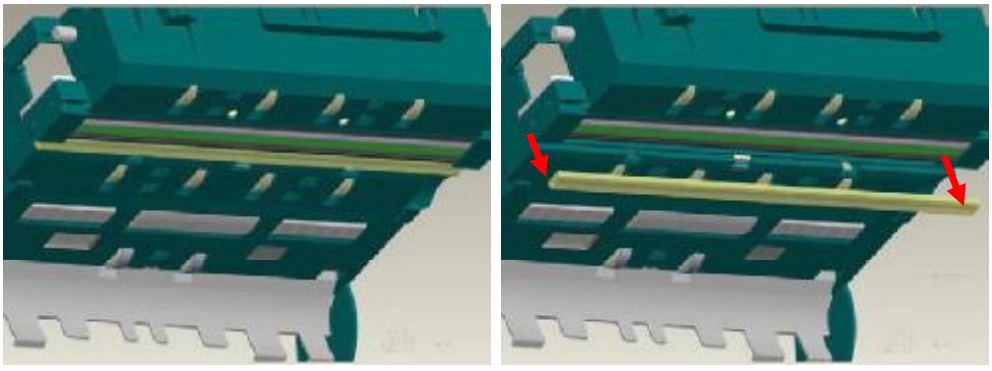
A. Glass plate and Acrylic plate on the GCT Assy.



B. remove the glass plate that fixed with adhesive tape.



C. remove Acrylic plate that fixed with adhesive tape.



## 3.8. GCL Ass'y

GCL Ass'y consists of GCL Board, UV Sensor, GCL Shaft-D Ass'y, Brush Roller Ass'y, Trans CIS(Contact Image Sensor), TR Sensor, Encoder Ass'y, GCL Shaft-C Ass'y, GCL Shaft-B Ass'y and GCL Shaft-A Ass'y.

Lower Discrimination Module

| Part | Ass'y |
|---|---|
| GCL Board | |
| UV Sensor | Ref UV Ass'y |
| | Trans UV Ass'y |
| GCL Shaft-D Ass'y | GCL Roller-D |
| | Roller Belt |
| | Double Pulley |
| Brush Ass'y | Brush |
| | GCL Pulley |
| Trans CIS | |
| TR Sensor Ass'y | |
| Encoder Ass'y | Encoder |
| | Encoder Gear |
| GCL Shaft-C Ass'y | GCL Roller-C |
| | GCL Pulley |
| | GCL Gear |
| GCL Shaft-B Ass'y | |
| GCL Shaft-A Ass'y | GCL Roller-A |
| | GCL Pulley |

## GCL Ass'y Contents

**3.8.1. GCL Board**

**3.8.2. UV Sensor**

**3.8.3. GCL Shaft-D Ass'y**

**3.8.4. Brush Ass’y**

**3.8.5. Trans CIS (Contact Image Sensor)**

**3.8.6. Trans Sensor Ass'y**

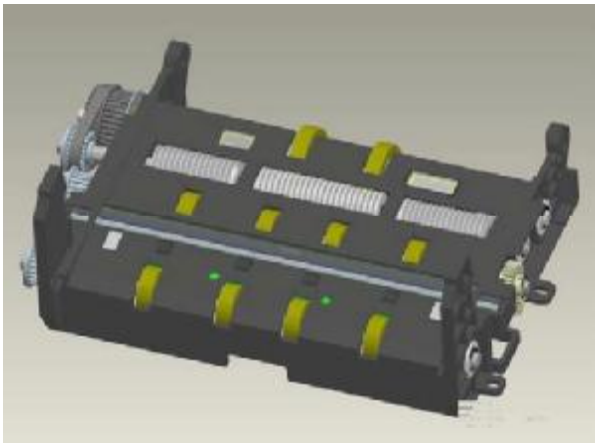
**3.8.7. Encoder Ass’y**

**3.8.8. GCL Shaft-C Ass'y**

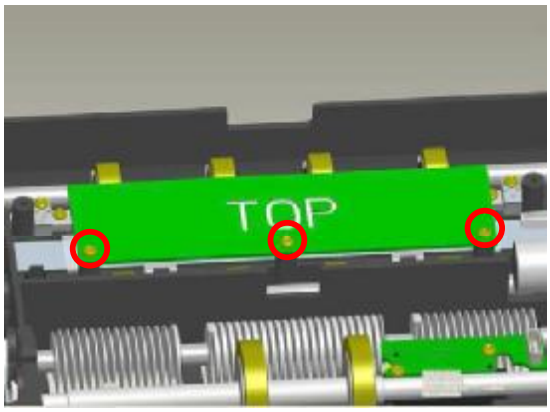
**3.8.9. GCL Shaft-B Ass’y**

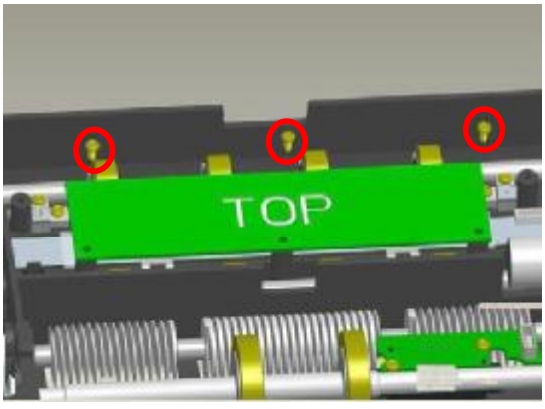
**3.8.10. GCL Shaft-A**

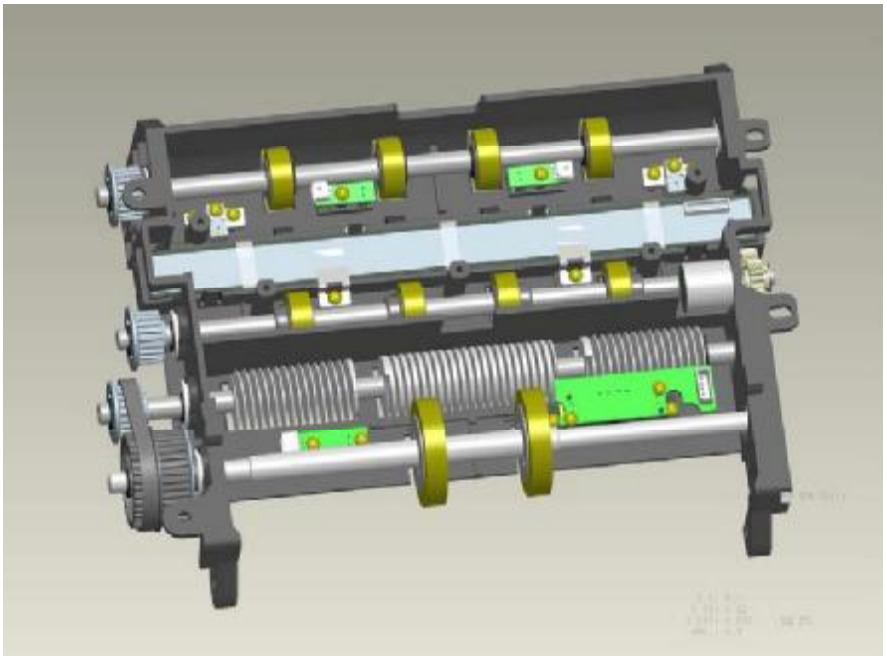
## 3.8.1 Disassemble GCL Board



A. unloose the 3 screws on the GCL board.

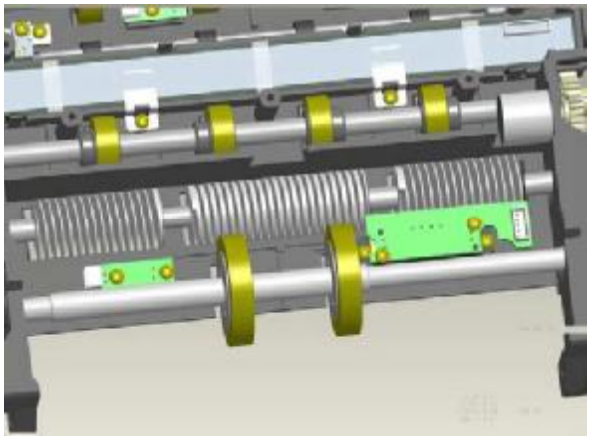


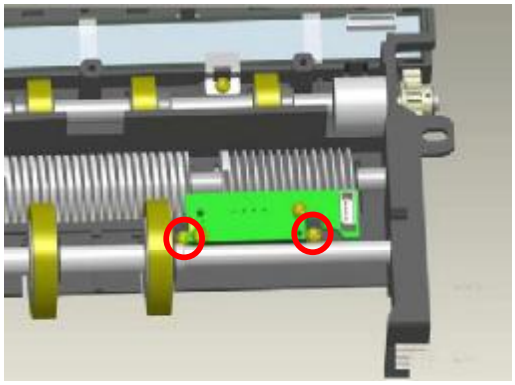


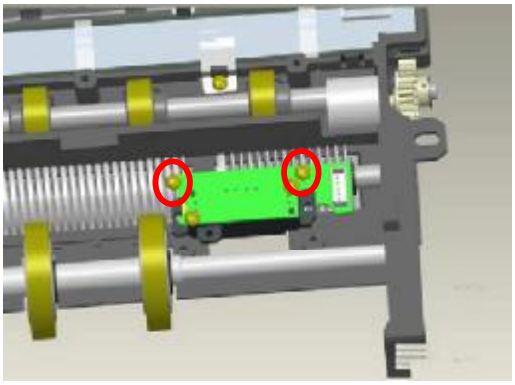
## 3.8.2 Disassemble UV Sensor

A. REF UV sensor and Trans UV sensor

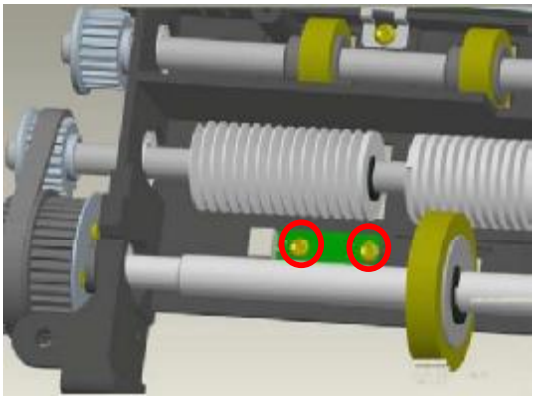


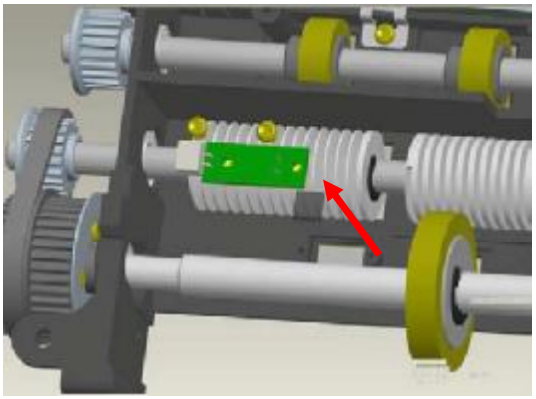
B. Unloose the screws to remove REF UV sensor.





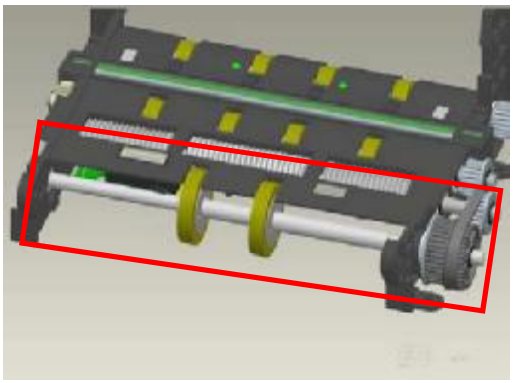
C. Unloose the screws to remove Tran UV sensor.



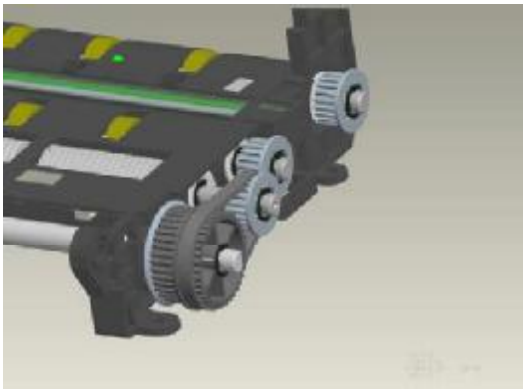


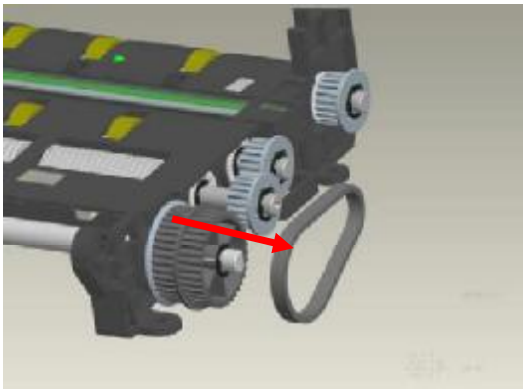
## 3.8.3 Disassemble GCL shaft-D assy

A. remove Double pully, Belt(153p3m6) and E-ring on the right side before you disassemble GCL Shaft-D assy.

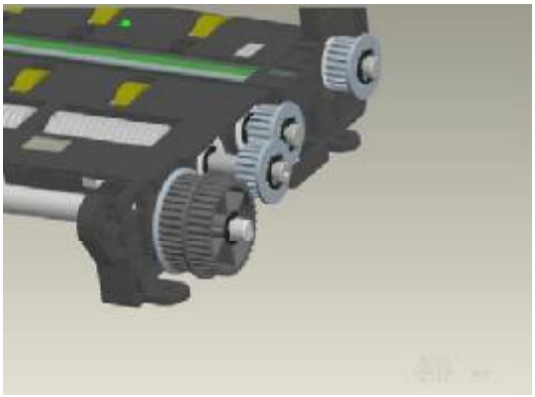


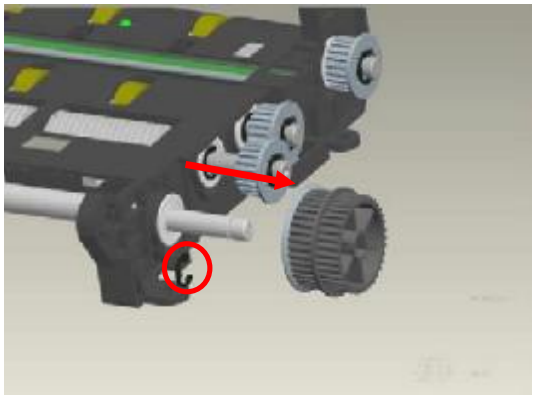
B. remove the BELT (153P3m6) to from the pulley.



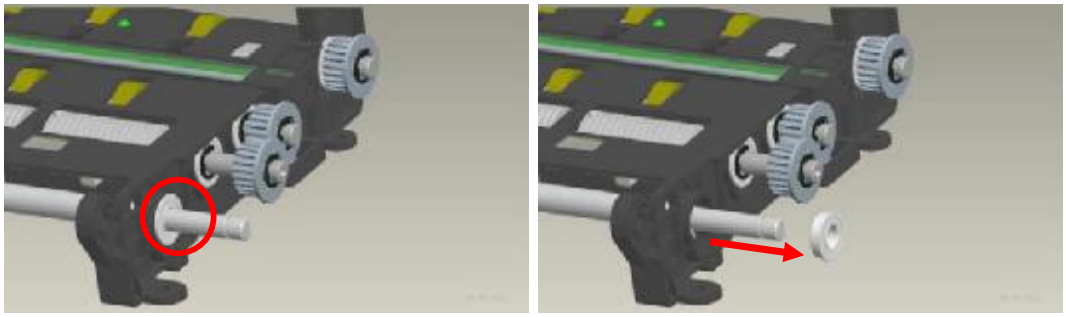


C. remove the E-ring to remove double pully.

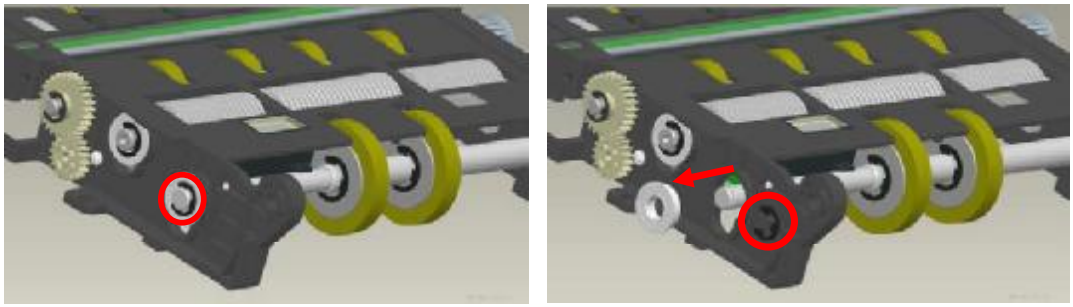




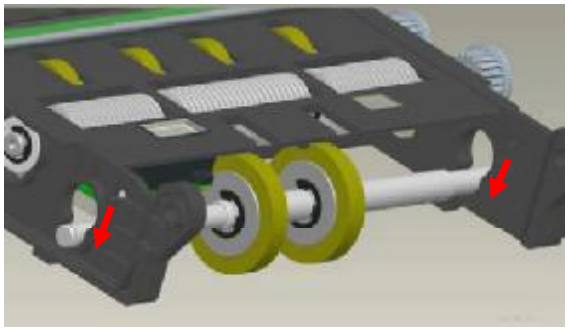
D. pull the bearing.



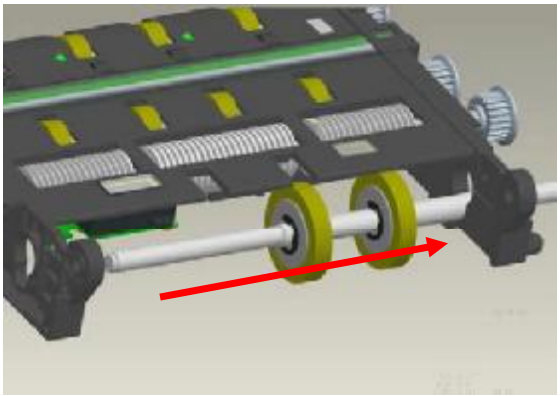
E. remove E-ring on the left side and remove the bearing.



F. Pull down the GCL Shaft-D assy.

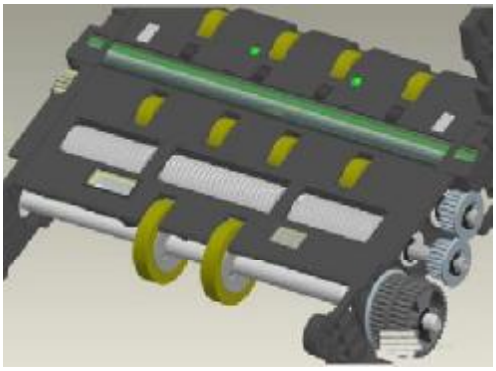


G. Push right the GCL shaft-D assy.

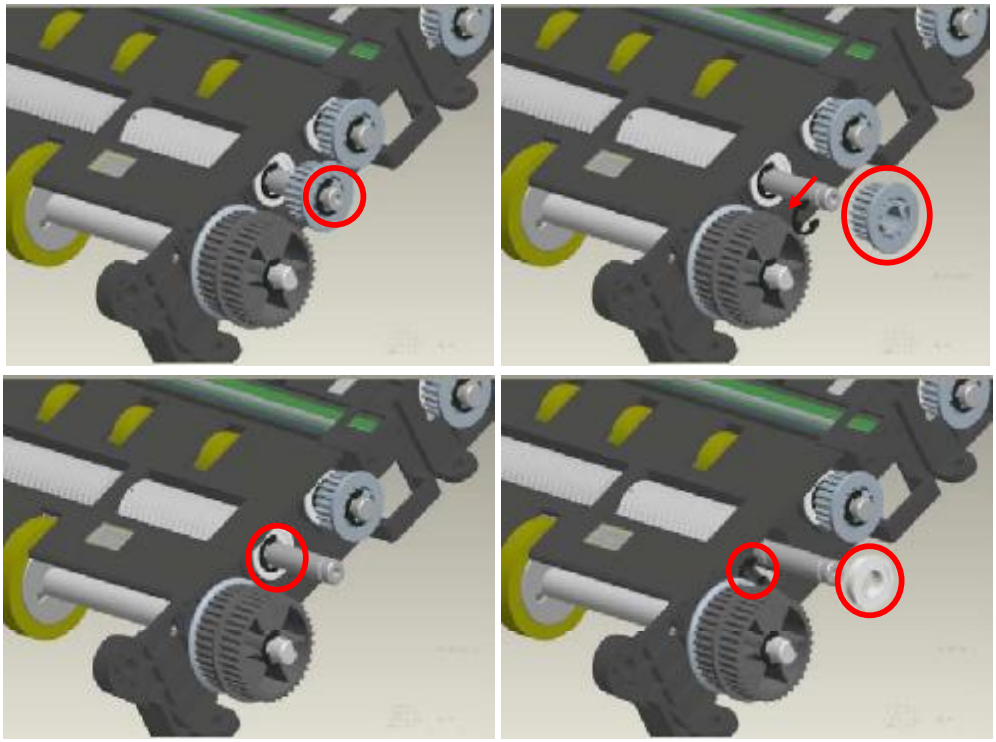


## 3.8.4 Disassemble Brush Assy

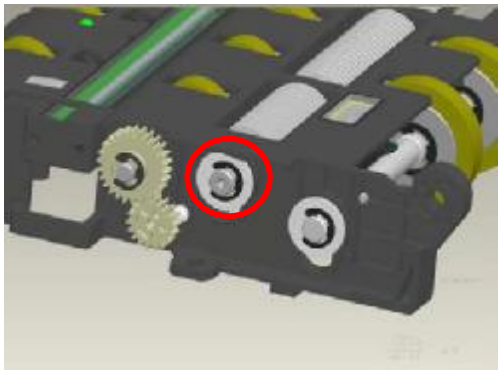
A. Bush assy.

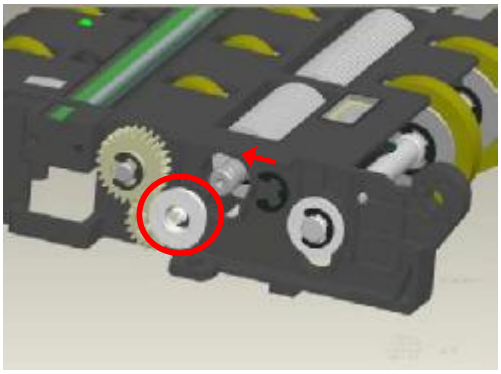


B. Pull the GCL pully and remove the E-ring and the bearing.

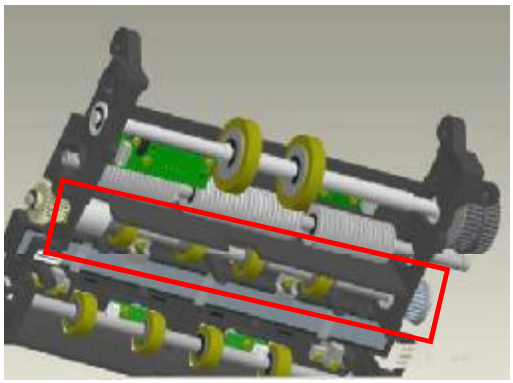


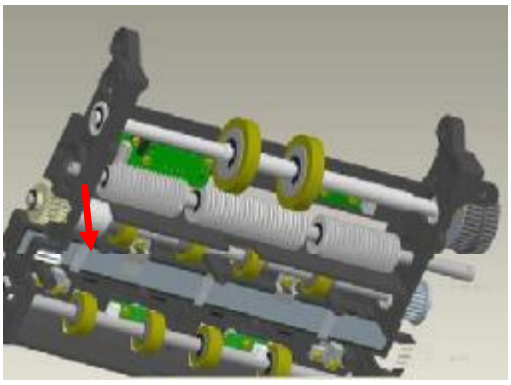
C. Remove the E-ring and the bearing on the left.

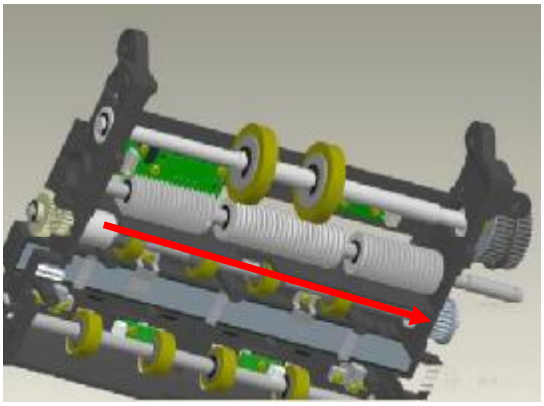




D. Pull down the brush assy and push right to remove.

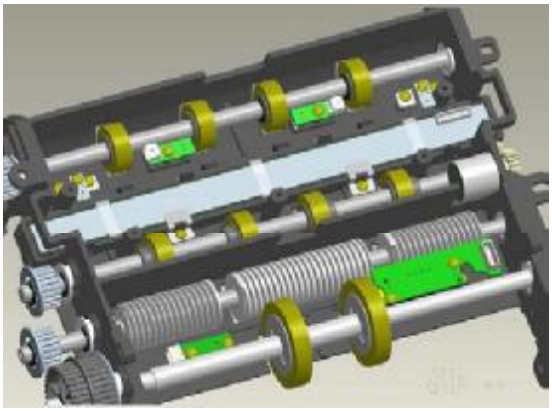




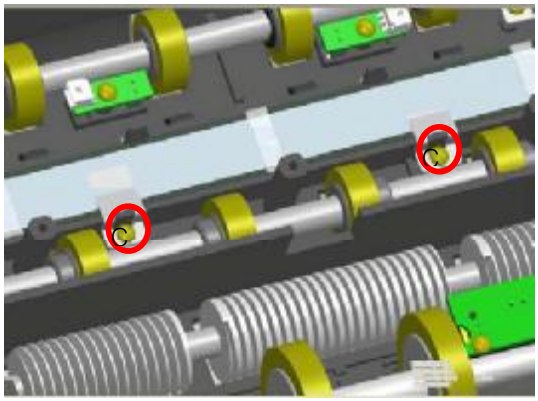


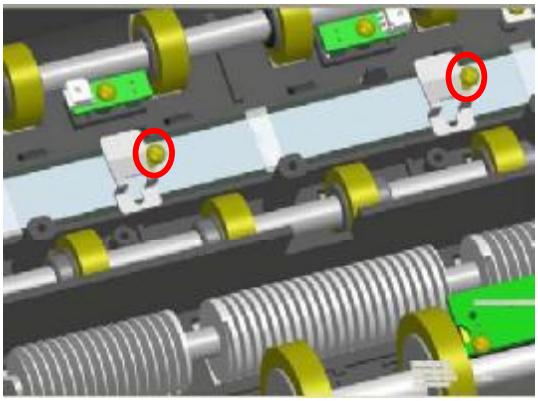
## 3.8.5 Disassemble Trans CIS

A. Trans CIS between GCL shaft-B and GCl shaft-C

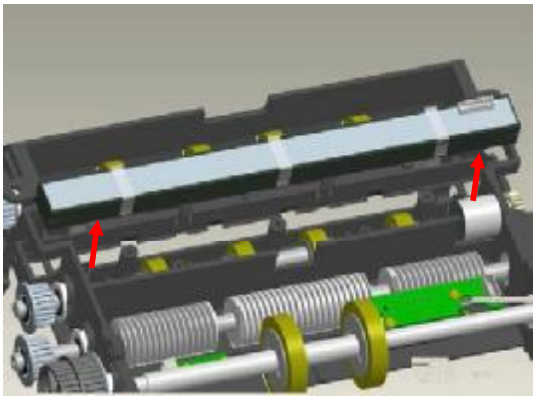


B. Unloose the screws on the top.



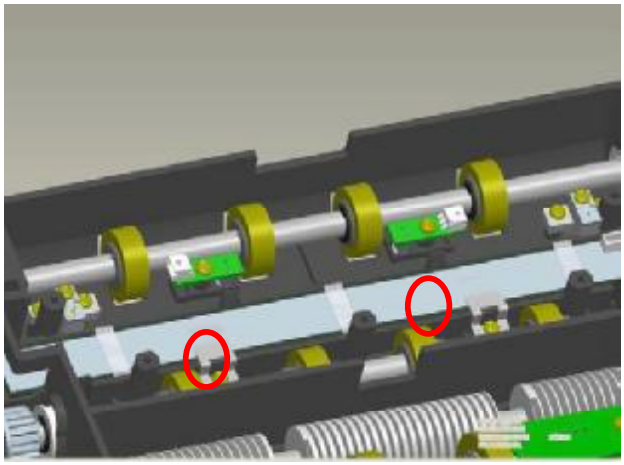


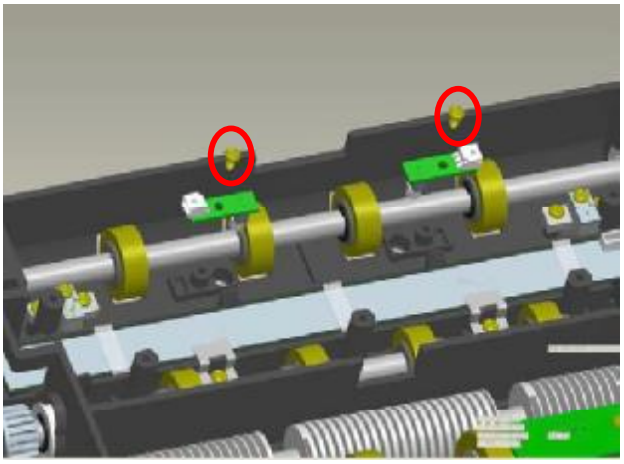
C. Pull up to remove.



## 3.8.6 Disassemble Trans Sensor Assy

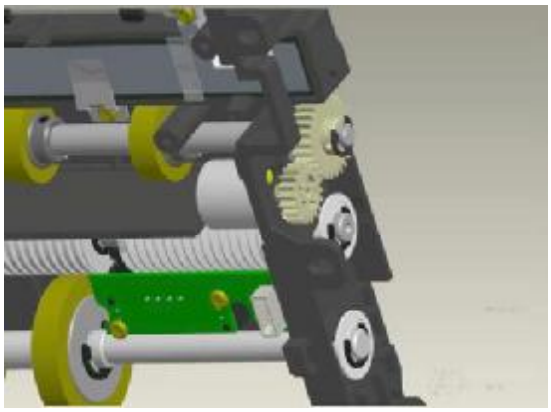
A. Unloose the screw at the bottom of GCL shaft-A assy.



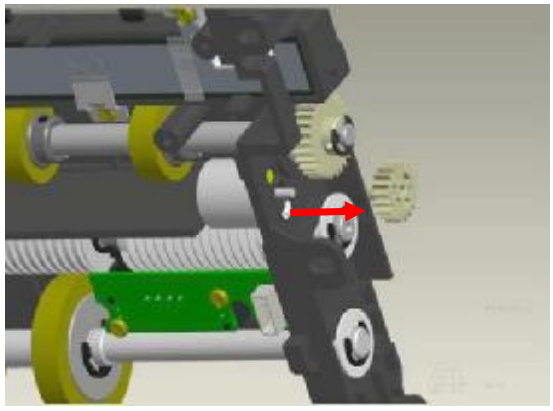


## 3.8.7 Disassemble Encoder Assy.

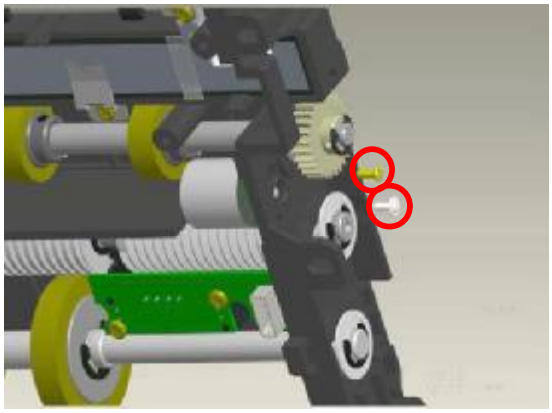
Encoder Assy.



A. Remove Encoder gear to disassemble assy.

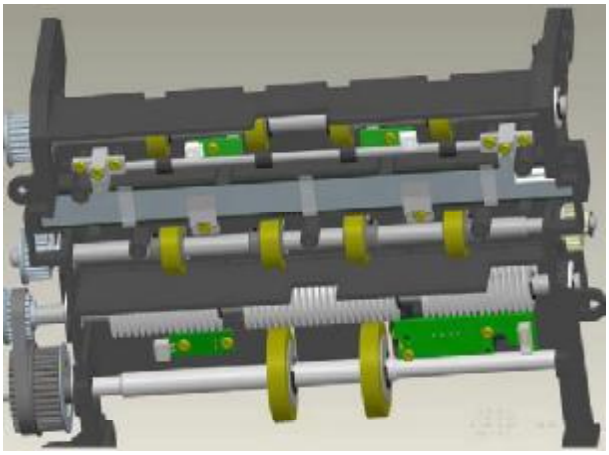


B. Unloose the screws to remove the encoder.

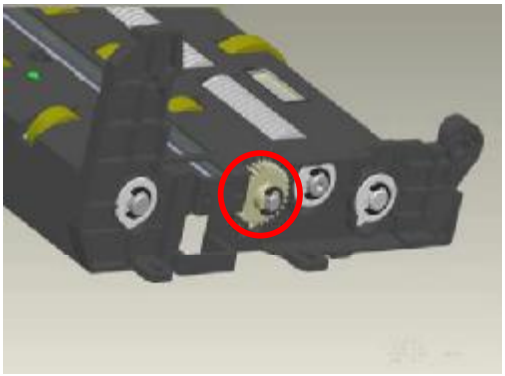


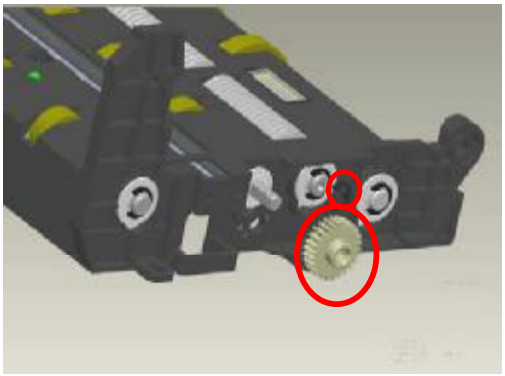
## 3.8.8 Disassemble GCL Shaft-C assy

GCL Shaft-C Ass'y

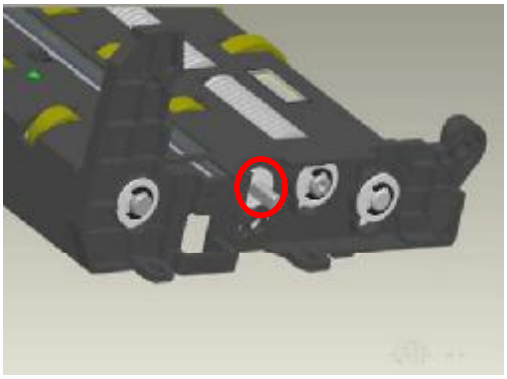


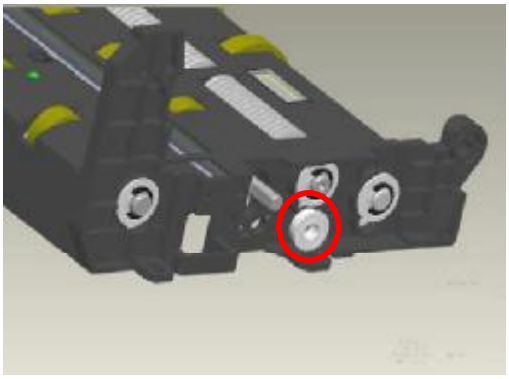
A. Remove E-ring on the right and pull the GCL gear.



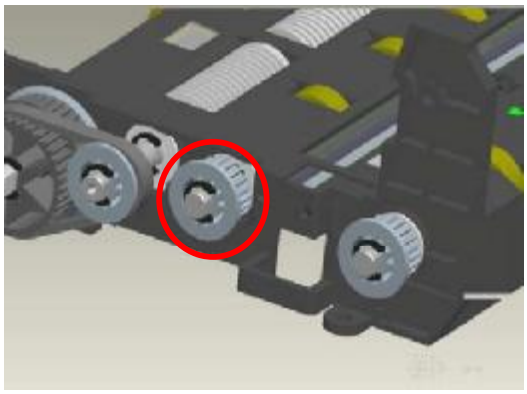


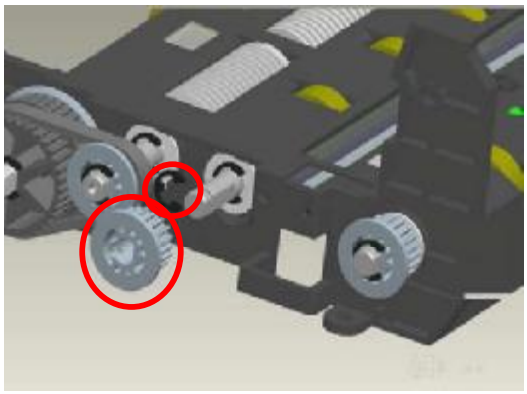
B. Pull the bearing to remove.



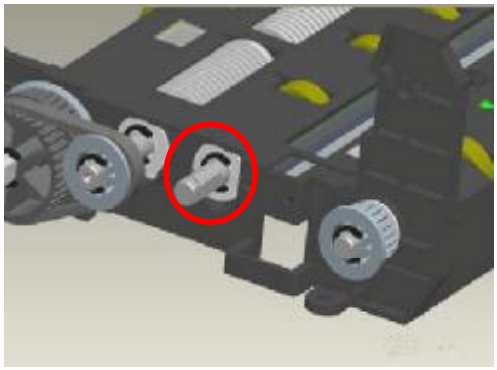


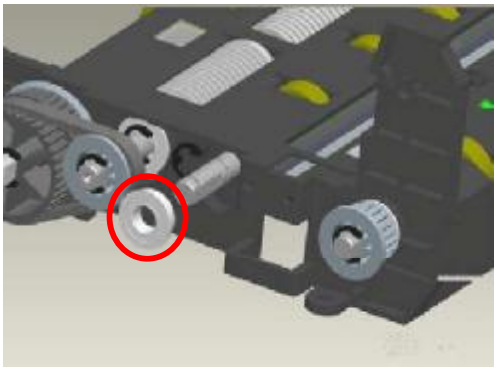
C. Pull the GCL pully on the left.



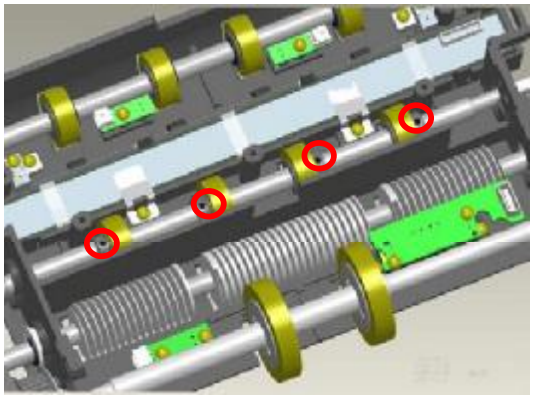


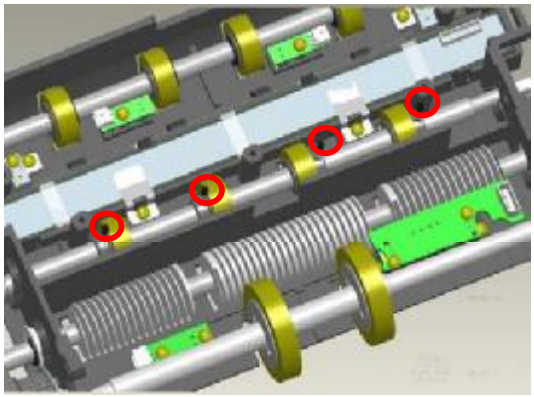
D. remove E-ring and the bearing.



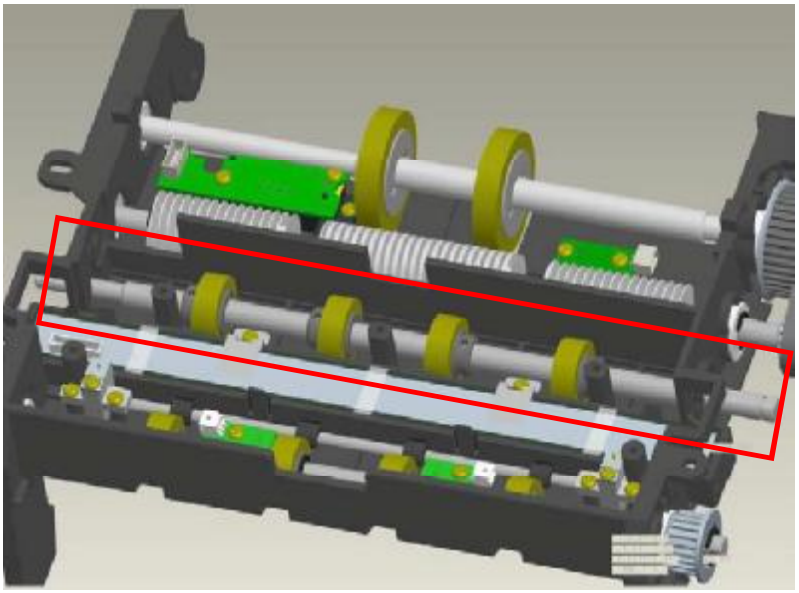


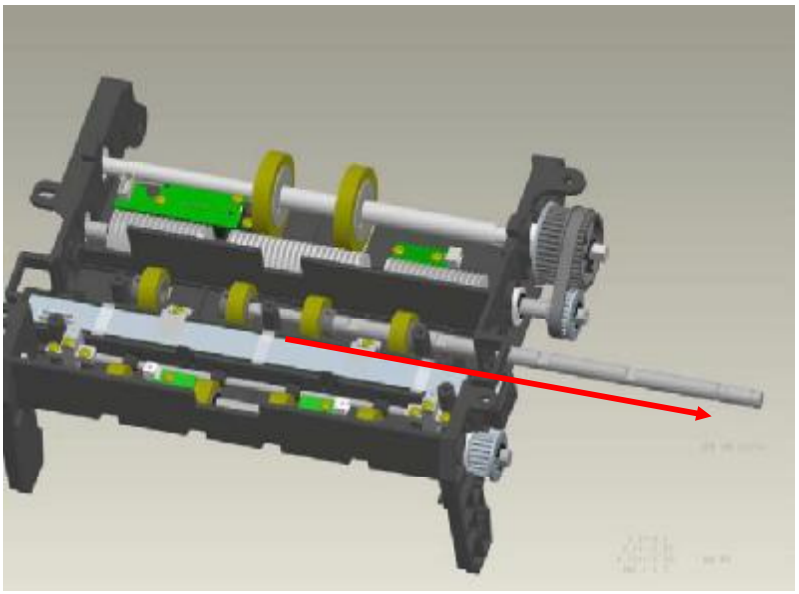
E. Unloose the stripper bolts.





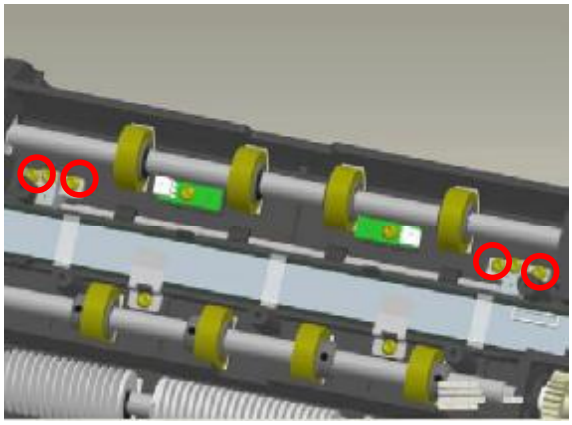
F. Push the GCL Shaft-C Assy to right.



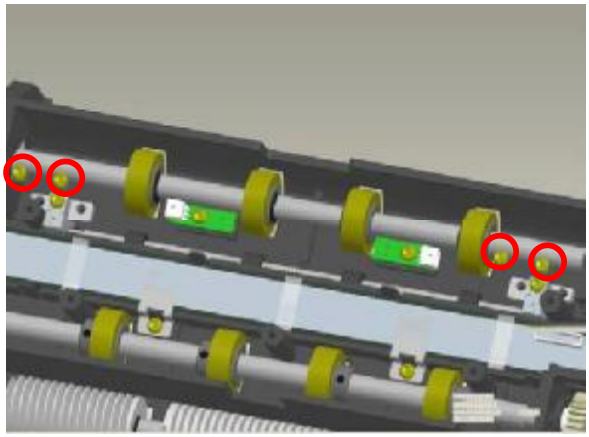


## 3.8.9 Disassemble Lower Discrimination roller 2nd Assy

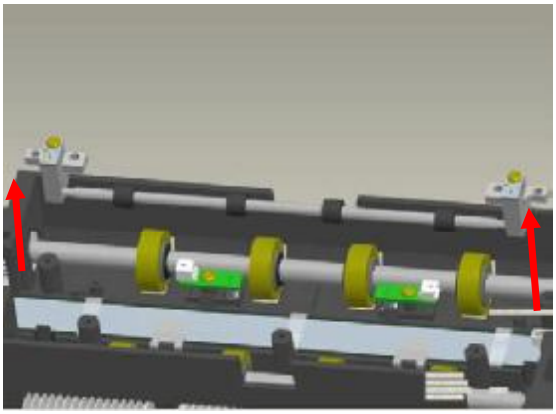
Lower Discrimination Roller 2nd Ass'y



A. Unloose the 4 screws on the Lower Discrimination Roller 2nd Ass'y

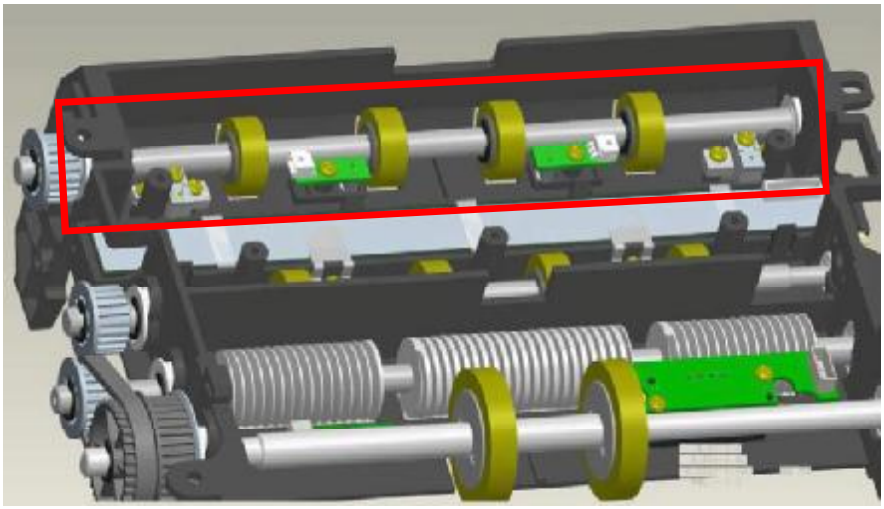


C. Lift up to remove.

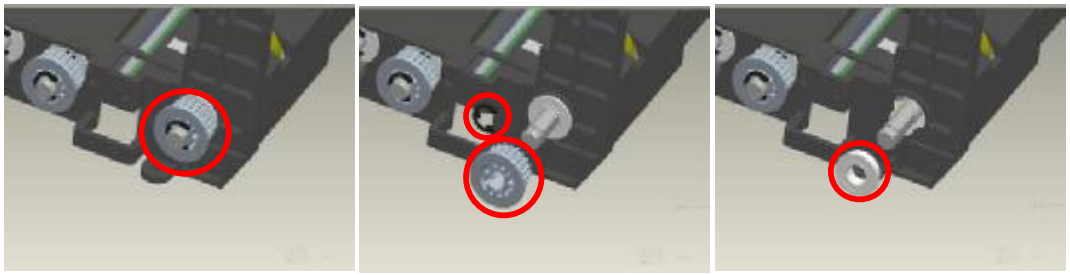


## 3.8.10 Disassemble GCL Shaft-A Assy

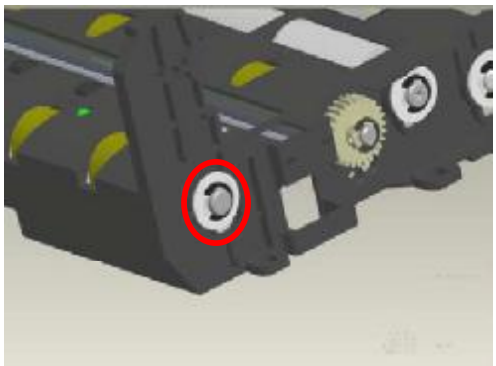
A. Remove GCL pulley on the left and the bearing on the right before you remove the GCL Shaft-A Assy.

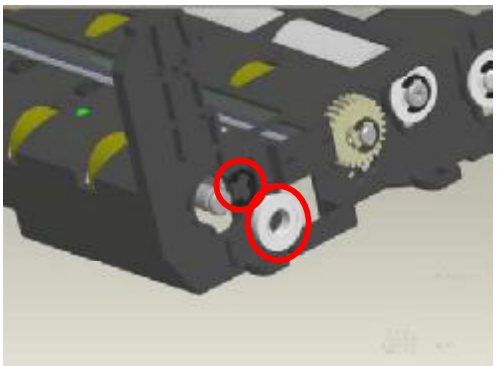


B. Pull the GCL pully and the bearing on the left.

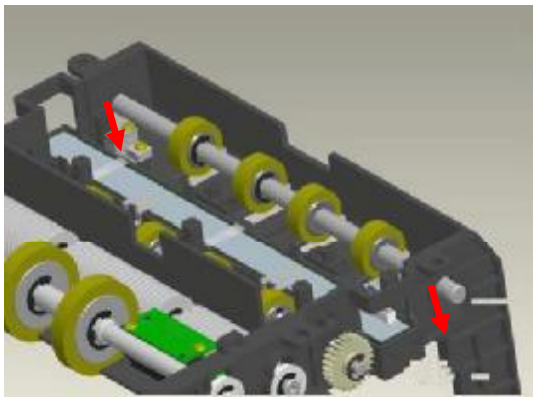


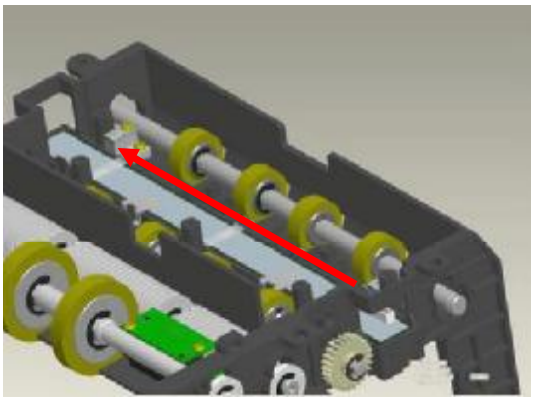
C. Remove the E-ring and the bearing on the right.

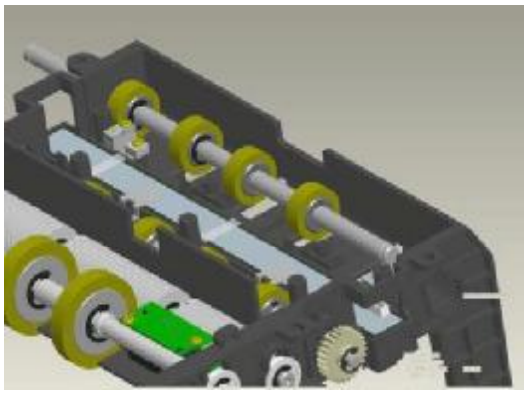




D. Push down the GCL Shaft-A Assy and slide left to remove.







## 3.9. Transfer Plate Part

Transfer Plate Part consists of GGT Ass'y and GGL Ass'y. GGT Ass'y is GGT Idle B/K Ass'y, LED 5mm Sensor Ass'y, GGT Shaft Ass'y, GGT Body. GGL Ass'y is GGL Idle B/k Ass'y, TR 5mm Sensor Ass'y, TR 5mm Sensor-GGL Ass'y, GGL Shaft-D Ass'y and GGL Body.

**Transfer Plate Part**

| Part | | Ass'y |
|---|---|---|
| GGT Ass'y | GGT Idle B/K Ass'y | GGT Idle Shaft-A Ass'y |
| | | GGT Idle Shaft-B Ass'y |
| | | GGT Roller |
| | | LED 5mm Sensor Ass'y |
| | | GGT Idle B/K |
| | LED 5mm Sensor Ass'y | |
| | GGT Shaft Ass'y | Spring Cap |
| | | GGT Spring |
| | | GGT Roller |
| | GGT Body | |
| GGL Ass'y | GGL Idle B/K Ass'y | GGL Shaft-A Ass'y |
| | | GGL Shaft-B Ass'y |
| | | GGL Shaft-B Ass'y |
| | | TR 5mm Sensor-GGL Ass'y |
| | | GGL B/K-A |
| | | GGL B/K-B |
| | TR 5mm Sensor Ass'y | |
| | GGL Shaft-D Ass'y | GGL B/K-C |
| | | GGL Spring |
| | | GGL Roller-D |
| | GGL Body | |

## Transfer Plate Part Contents

**3.9.1. GGT Ass'y**

**3.9.2. GGT Idle B/K Ass’y**

**3.9.3. GGT Idle B/K Ass’y**

**3.9.4. LED 5mm Sensor Ass'y and GGT Idle B/K Ass’y**

**3.9.4. Pocket Slide**

**3.9.6. GGL Ass'y**

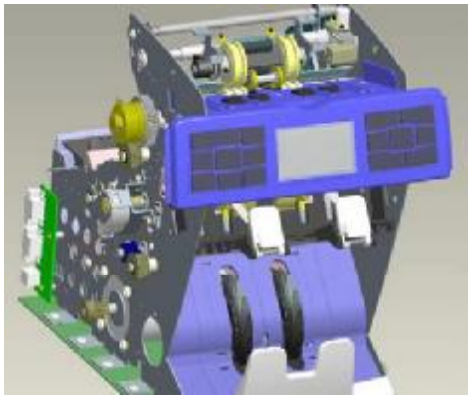
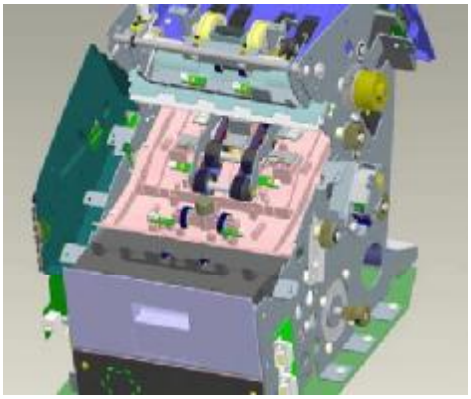
**3.9.7. GGL Idle B/K Ass’y**

**3.9.8. GGL Idle B/K Ass’y**

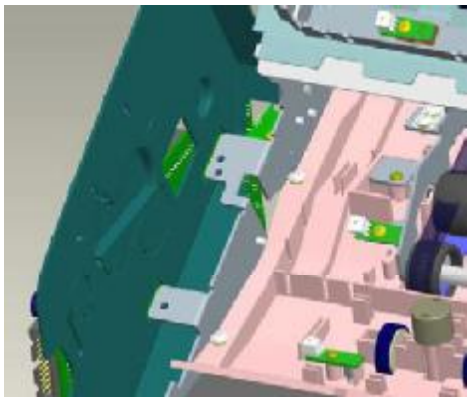
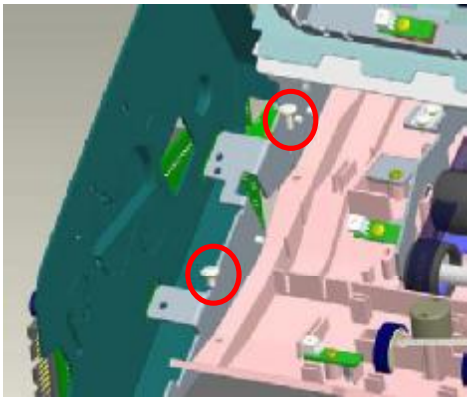
**3.9.9. TR 5mm Sensor Ass'y and Lower Transfer Idle Roller Ass’y**

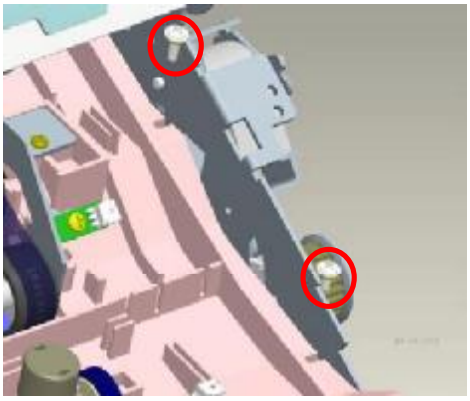
## 3.9.1 Disassemble GGT Assy

A. Remove Hopper cover, side covers and CIS Assy before you remove the GCT Assy.

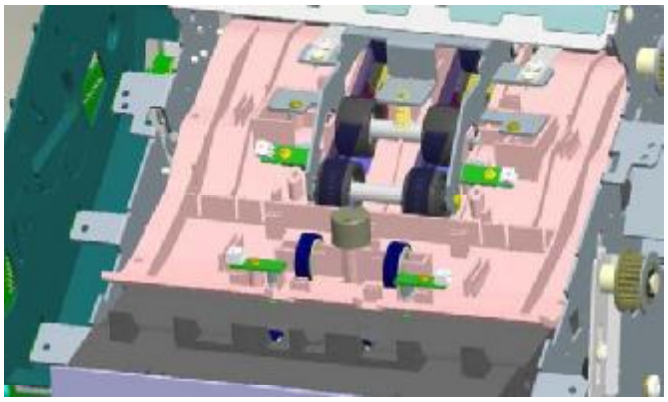



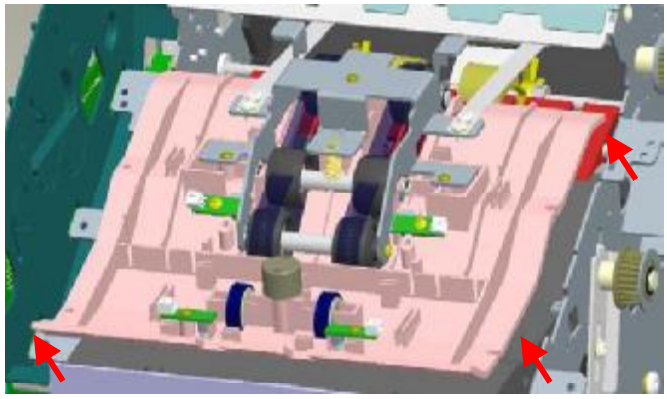
B. Unloose the screws.

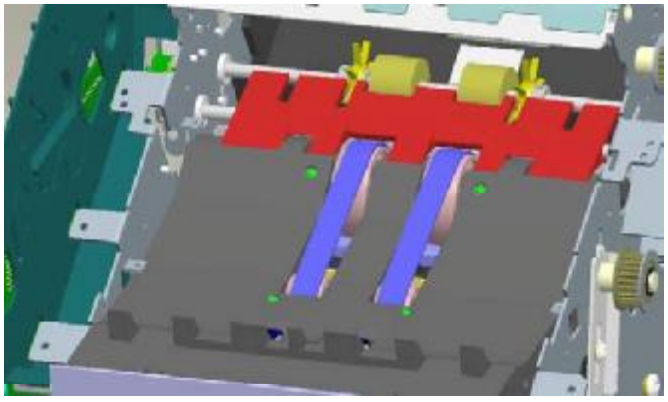





C. Lift up to remove.

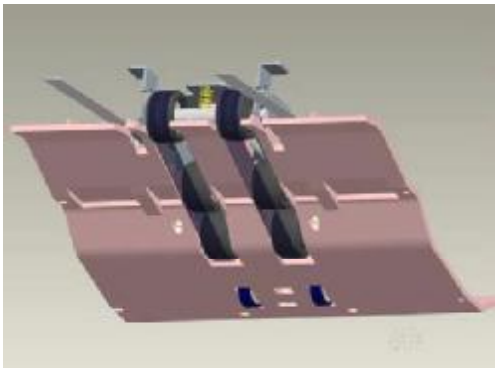


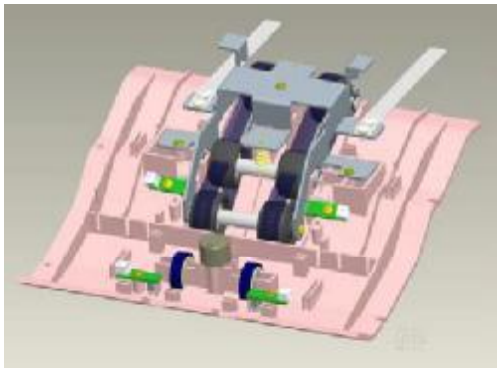




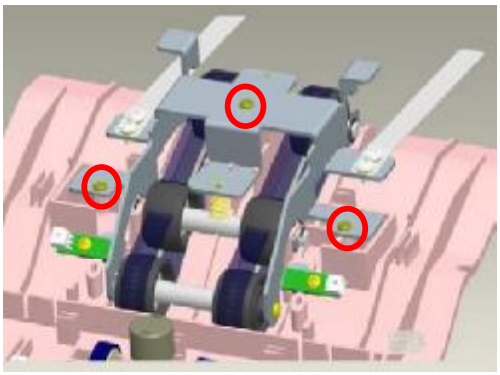
## 3.9.2 Disassemble the GGT Idle B/K assy

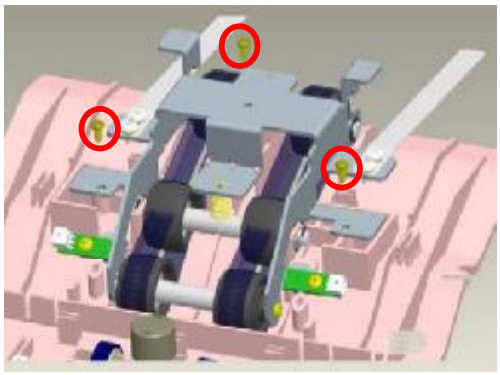
A. GGT Idle B/K Assy.

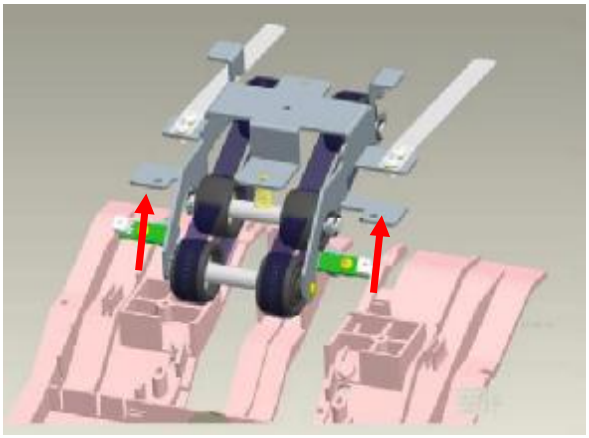




B. Unloose the screws to separate the GGT Idle B/K assy from the GGT assy.



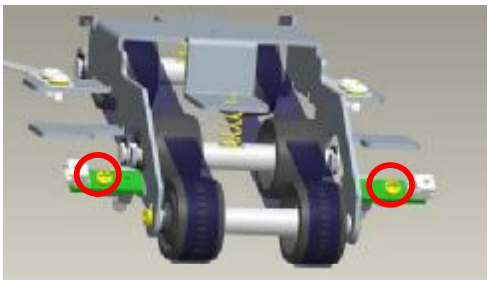


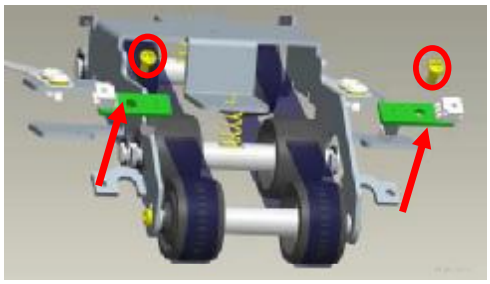


## 3.9.3. Disassemble GGT Idle B/K Ass’y

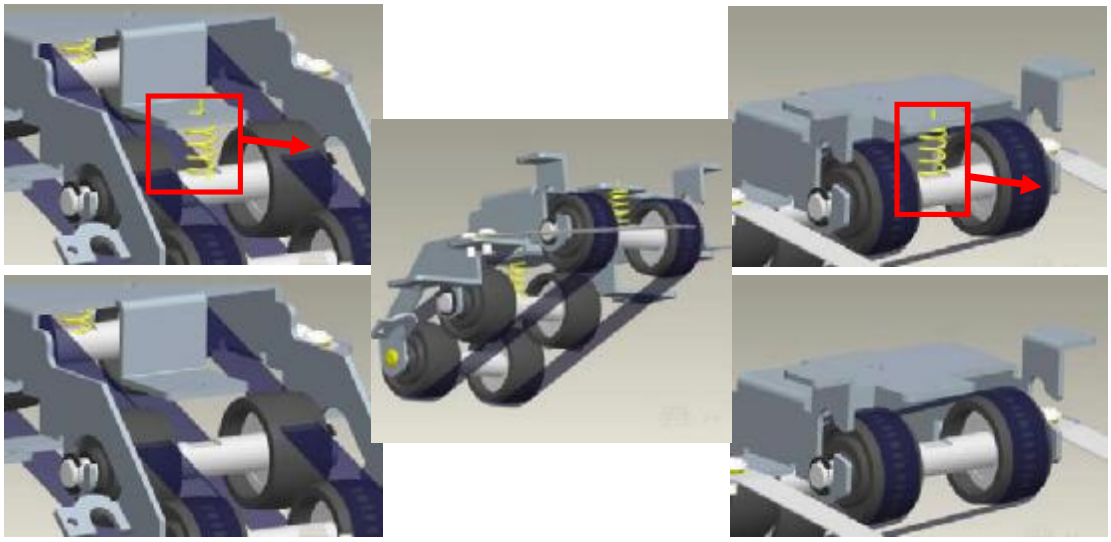
GGT Idle B/K Assy is GGT Idle Shaft-A Ass'y, GGT Idle Shaft-B Ass'y, 5mm SensorAss'y 2 and Upper GGT Idle B/K.

A. Unloose the screws to remove the LED 5mm sensor assy.

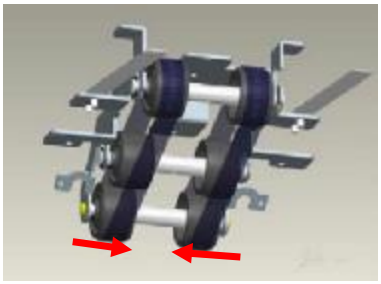




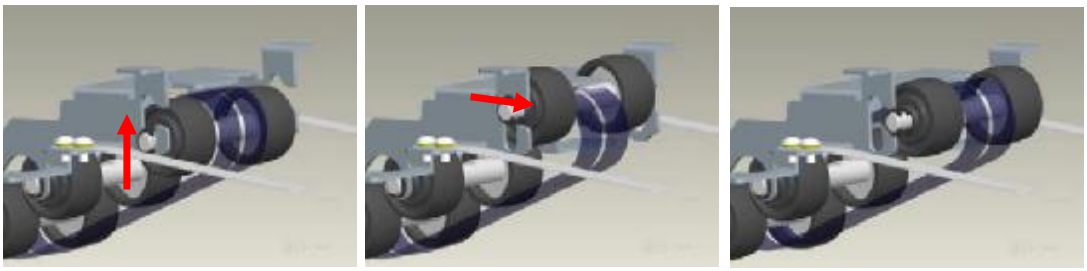
B. push and remove the springs



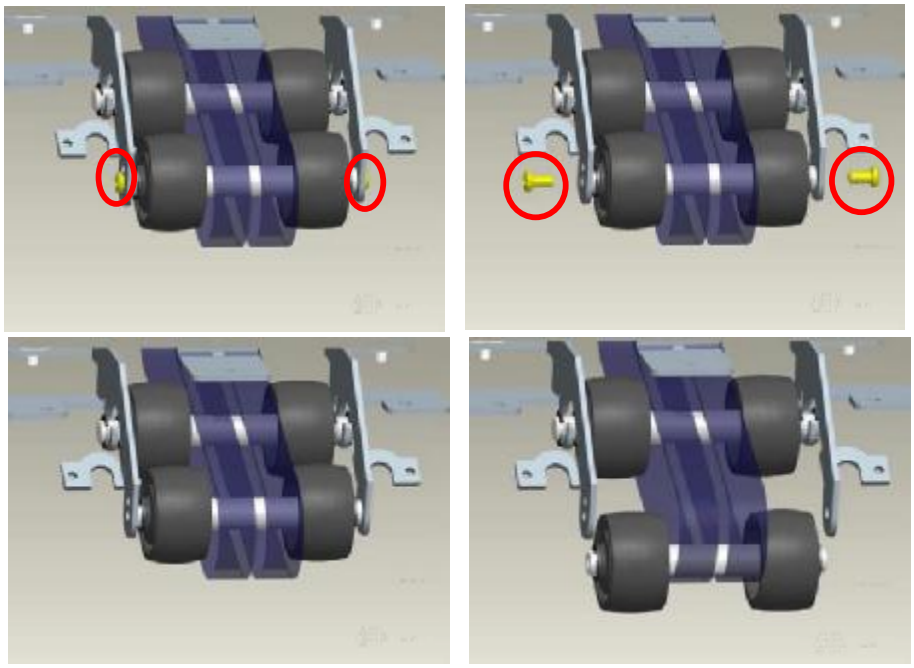
C. Slide the belts inside.



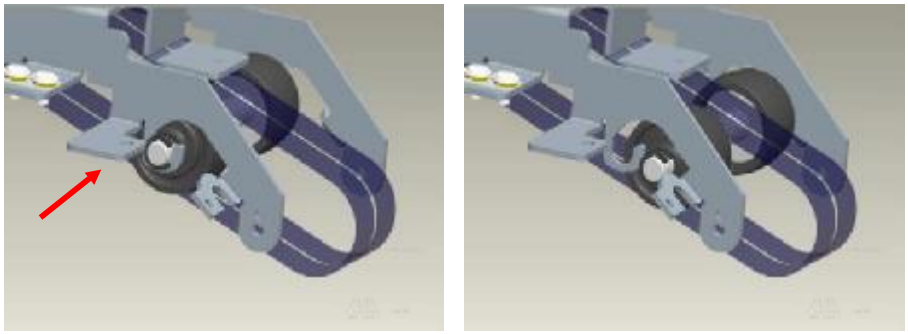
D. Lift the GGT Idle Shaft-A Assy and pull to remove.



E. Unloose the screws at sides to remove GGT Idle B/K assy.

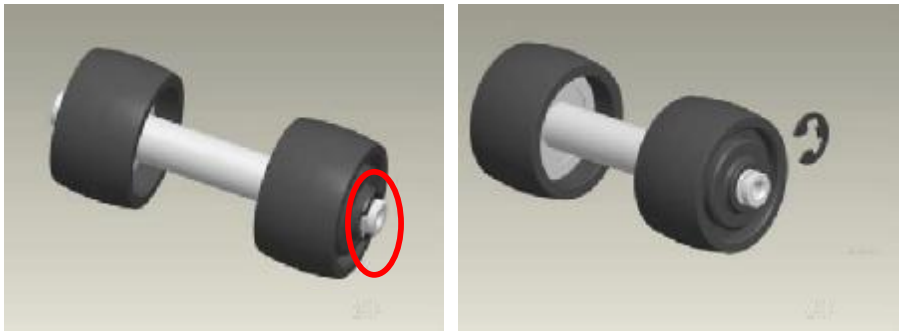


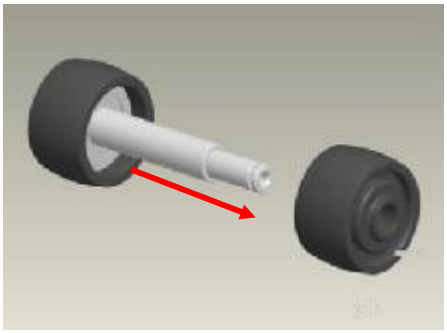
F. Lift the GGT Idle Shaft-A Assy up and pull to remove.



G. Remove the E-rings on the GGT Idle shaft-A Assy.

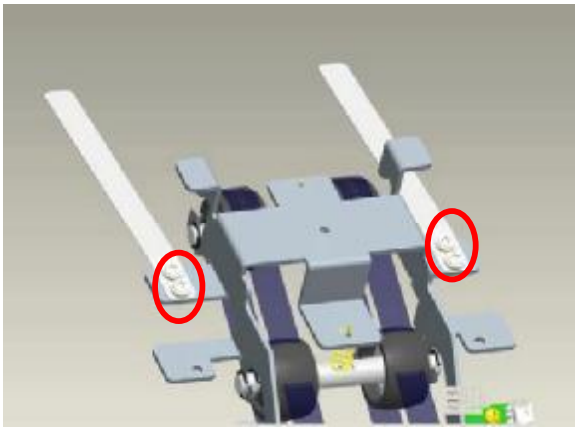
H. Remove the E-ring on the roller to separate from the shaft.



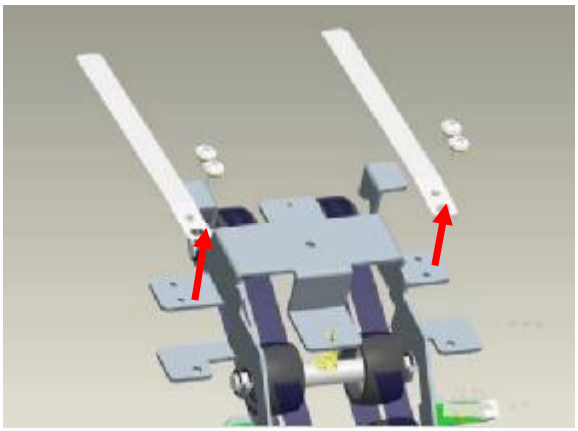


## 3.9.4 Disassemble Pocker Slide

A. unloose the screws.

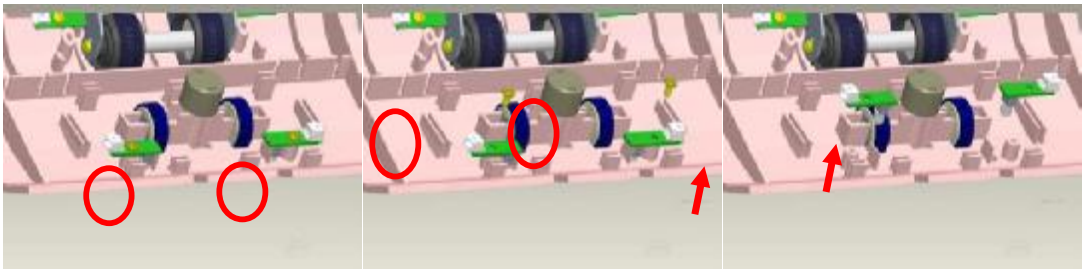


B. remove the Pocket slide.



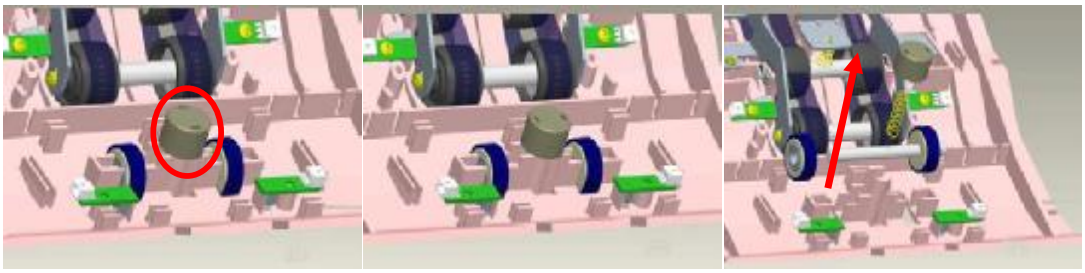
## 3.9.5 Disassemble LED 5mm Sensor Assy and GGT Shaft Assy.

A. Unloose the scews to remove LED 5mm Sensor Assy.



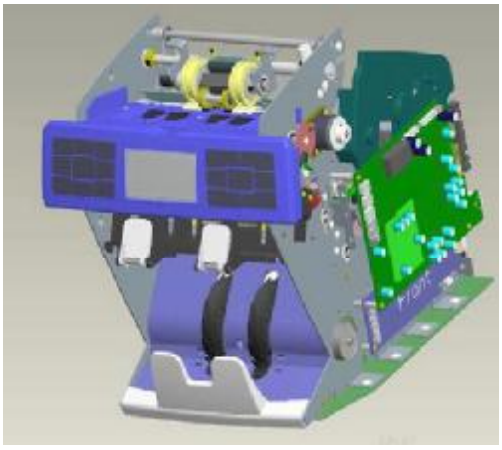
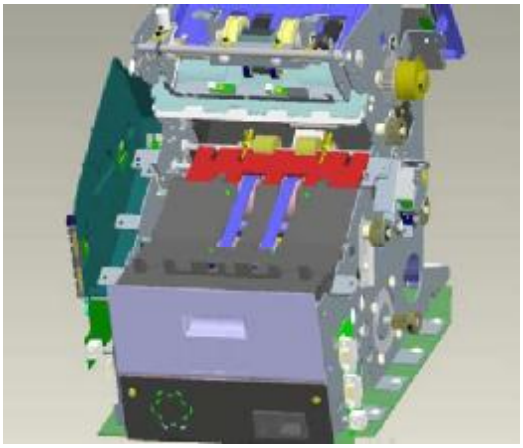
GGT Shaft Assy is Spring Cap, GGT Spring, Upper GGT Roller.

A. Push and turn the cab to remove.



## 3.9.6 Disassemble GGL Assy

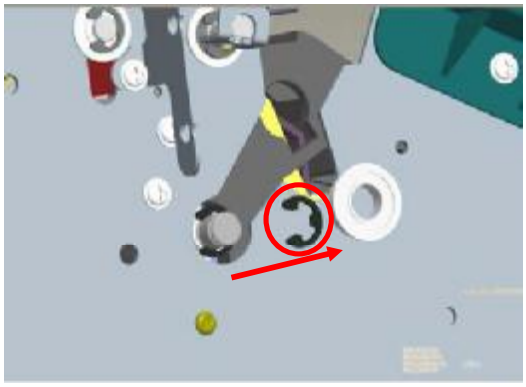
A. Removce Hopper cover, Side covers, CIS Assy and GGT assy before you proceed.

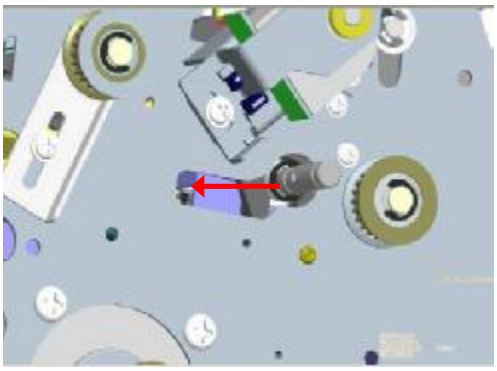
B. Remove E-ring on the left bottom of Solenoid. remove E-ring and pin.

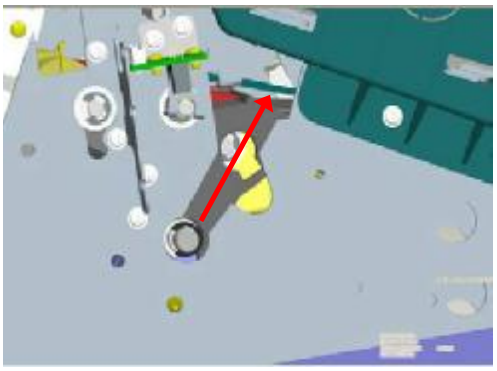
C. Remove E-ring and the bearing.

D. Remove E-ring on the right then Remove the bearing.

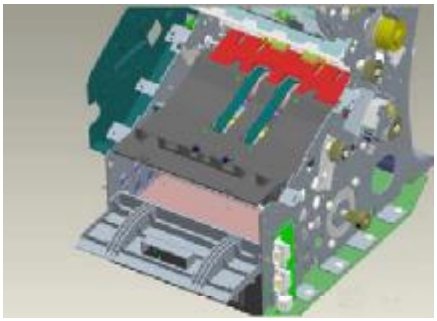


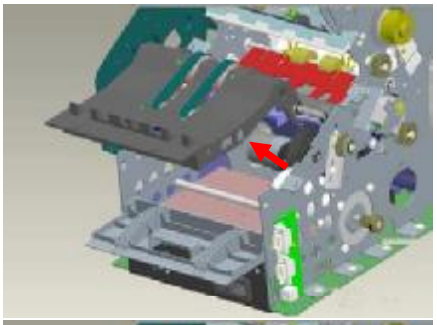
E. Push the shaft at sides.

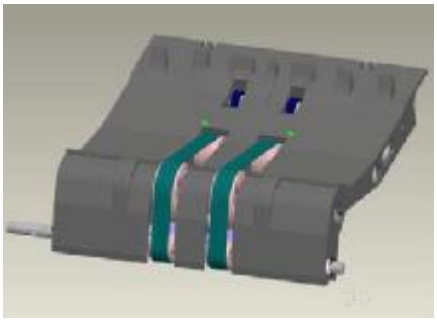


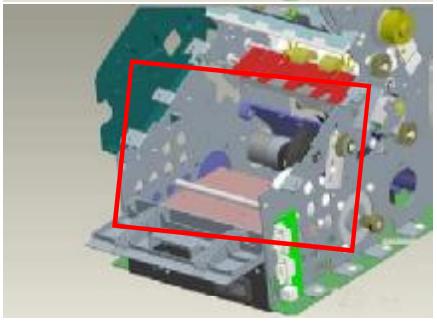


F. Lift up to remove.

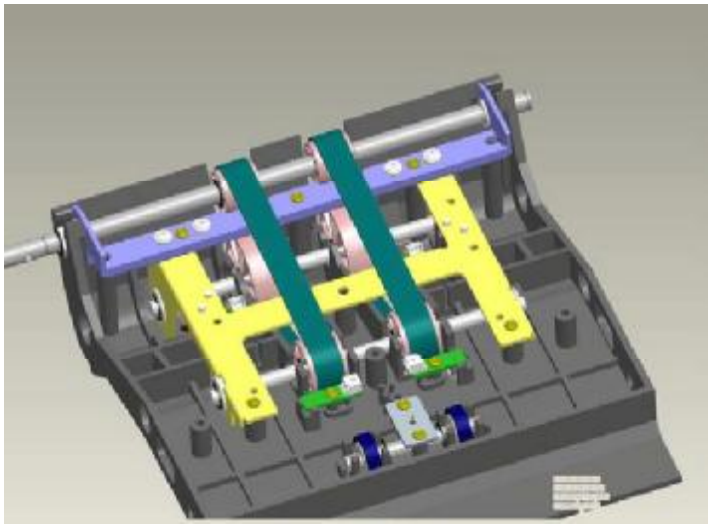




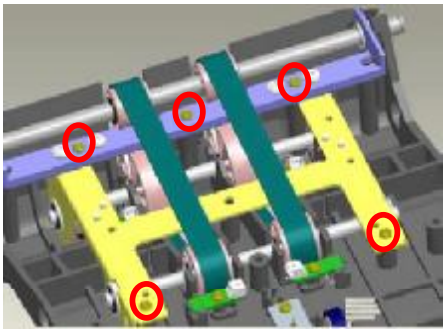


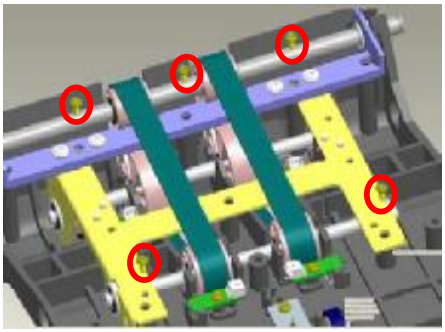


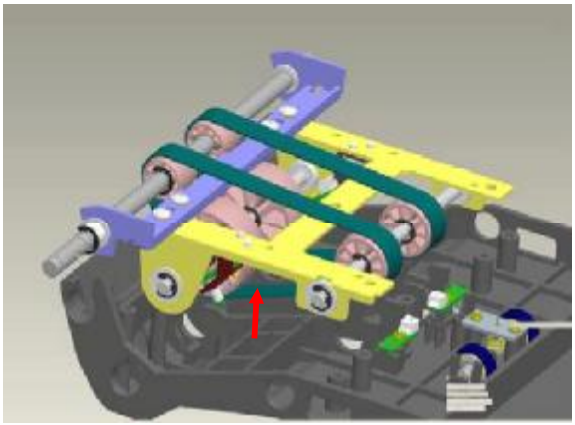
## 3.9.7 Remove GGL Idle B/K Assy



A. Unloose the 5 screws to separate the GGL Idle B/K Assy from the GGL Assy.



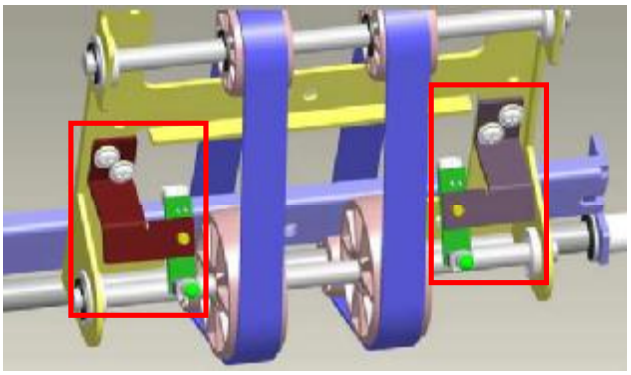




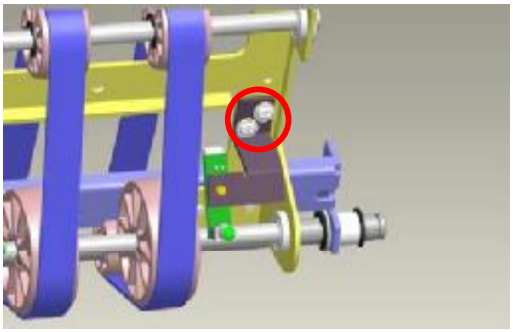
## 3.9.8. Disassemble GGL Idle B/K Ass’y

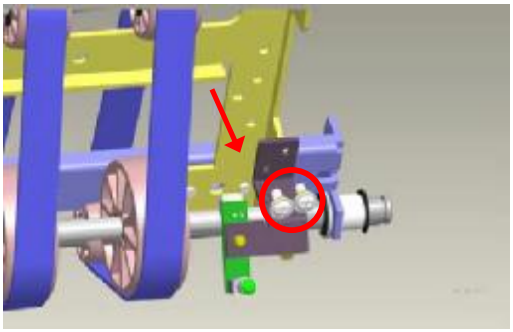
GGL Idle B/K Ass’y is GGL Shaft-A Ass'y, GGL Shaft-B Ass'y, GGL Shaft-C Ass'y, TR5mm Sensor Ass'y, GGL B/K-A and GGL B/K-B.

A. Remove the bracket first.

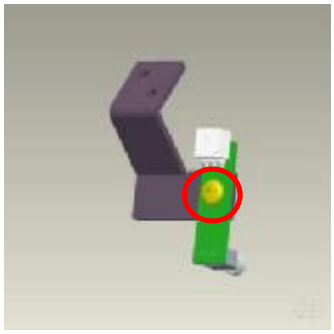


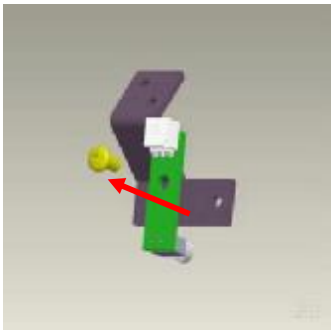
B. Unloose the screws.



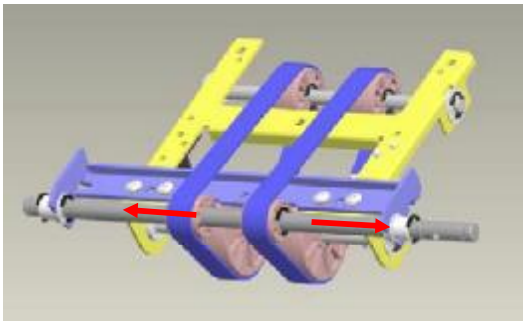


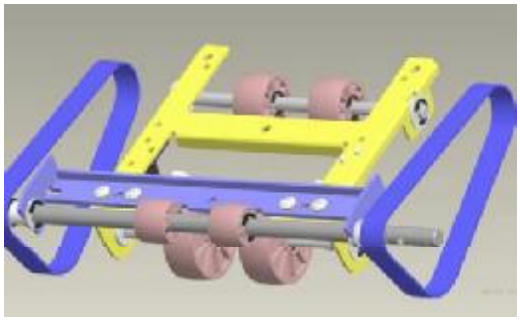
C. Unloose the screw to remove the TR 5mm Sensor Assy.



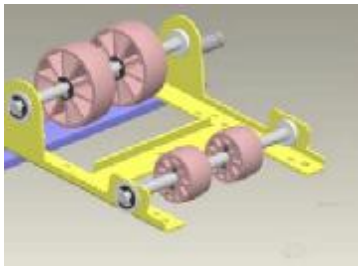


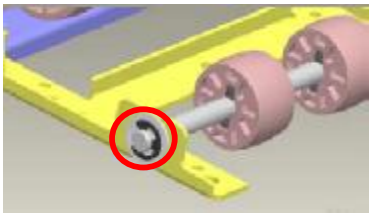
D. Slide out the belts.

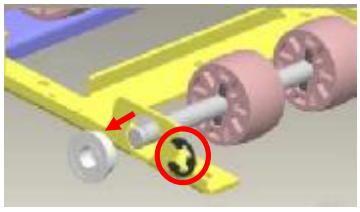


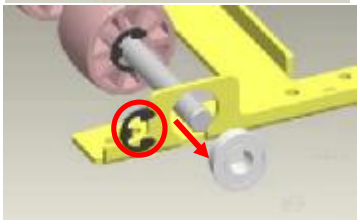


E. Remove the E-rings and the bearing at the sides of GGL Shaft-C Assy.

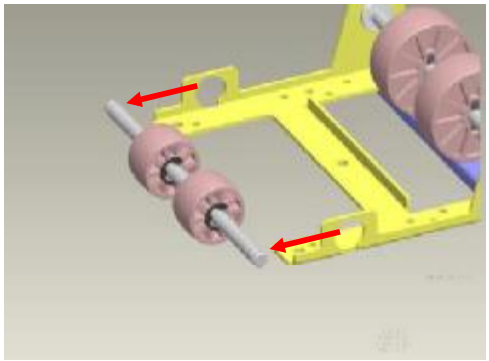




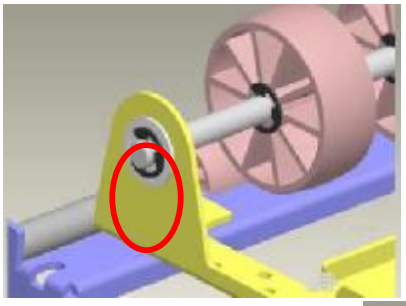


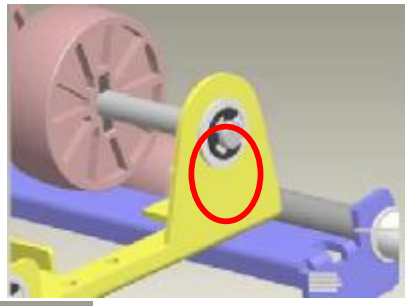


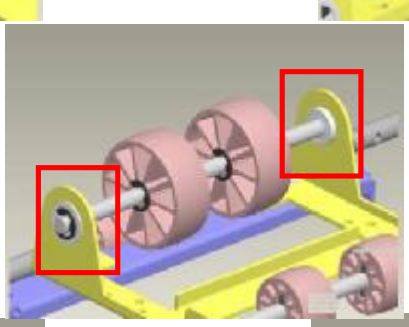
F. Pull the GGL Shaft-C Assy out to remove.

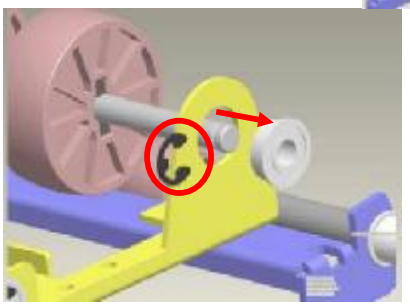


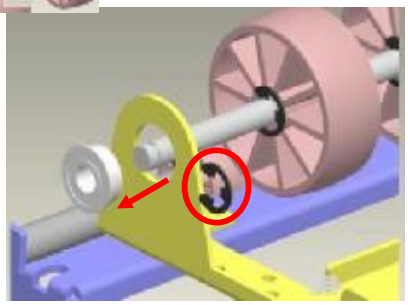
G. Remove the E-rings at the sides of GGL Shaft-B assy.



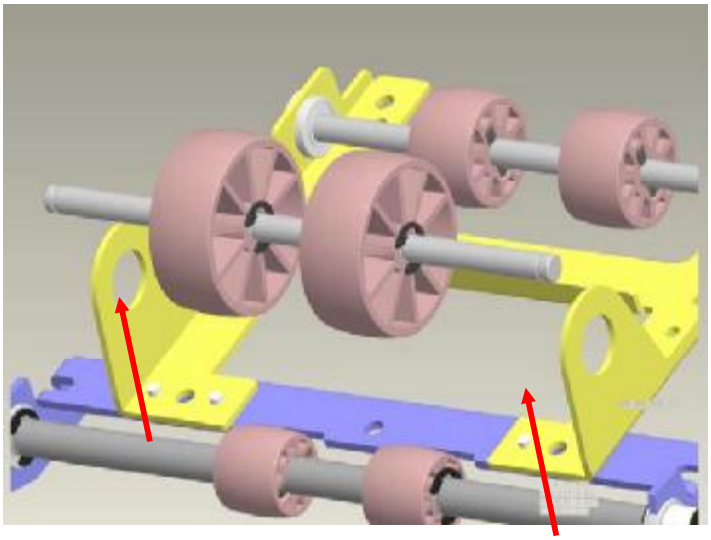




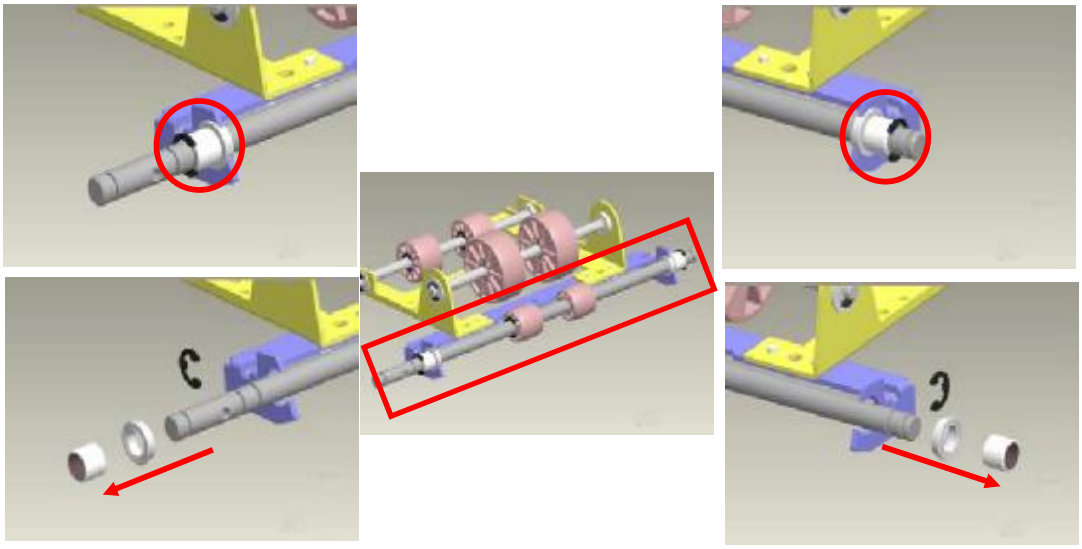




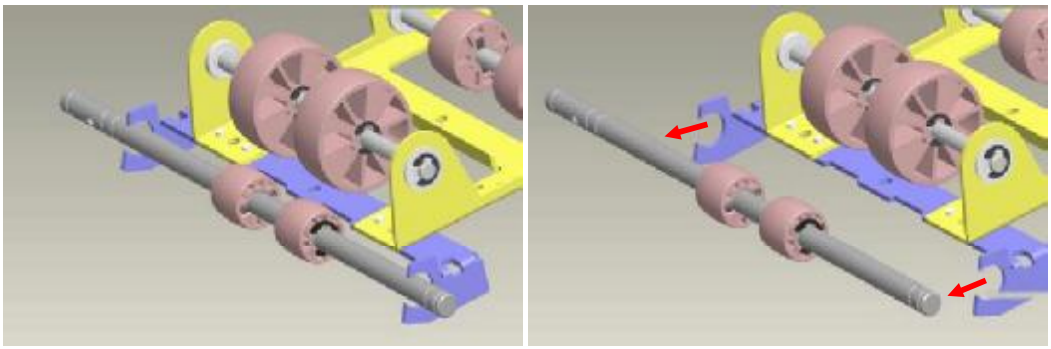
H. Remove the bearings and lift to remove.



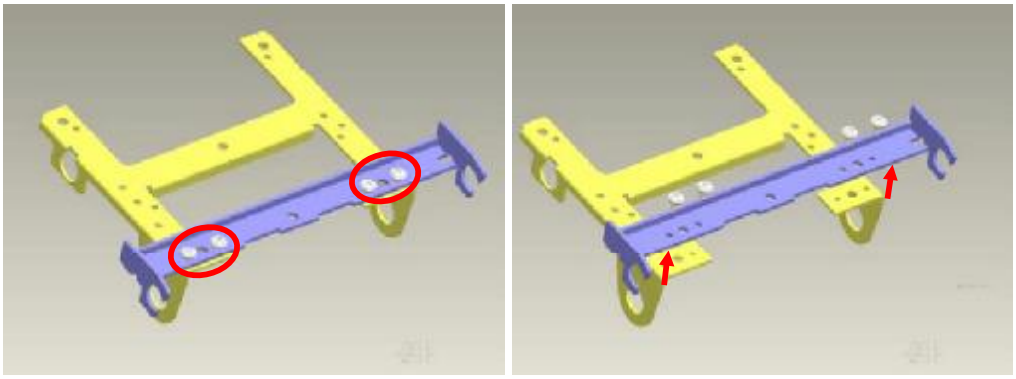
I. Remove the E-rings and the bearings at the sides of GGl Shaft-C Assy.



J. pull out the GGL Shaft-C Assy to remove.



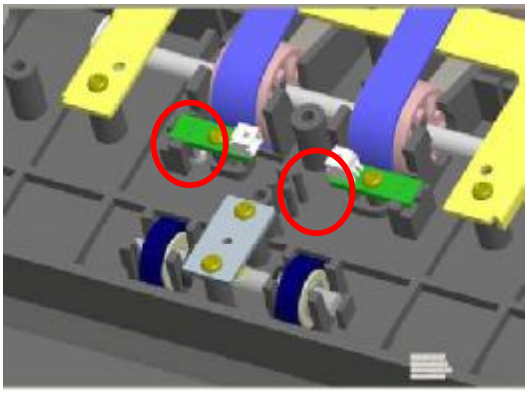
K. Unloose the screws to serate the GGL B/K-A from the GGL B/K-B.

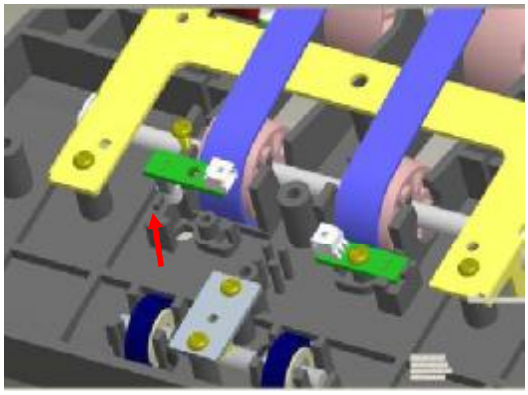


## 3.9.9 Disassemble TR 5mm sensor assy and Lower Trasnfer Idle Roller Assy

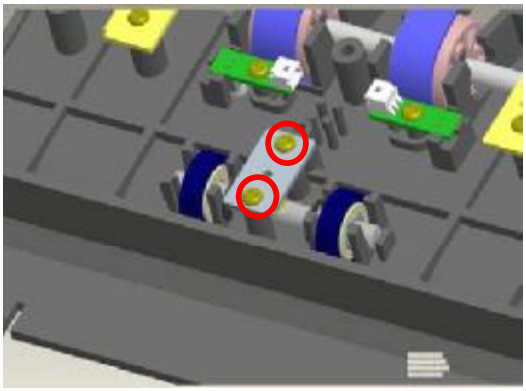
There are TR 5mm Sensor Assy at the bottom of GGl Assy.

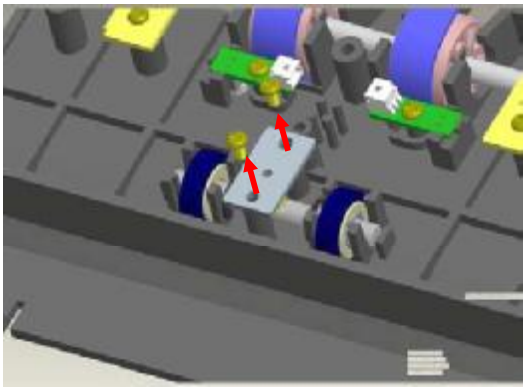
A. Unloose the screw to remove the TR 5mm Sensor Assy.

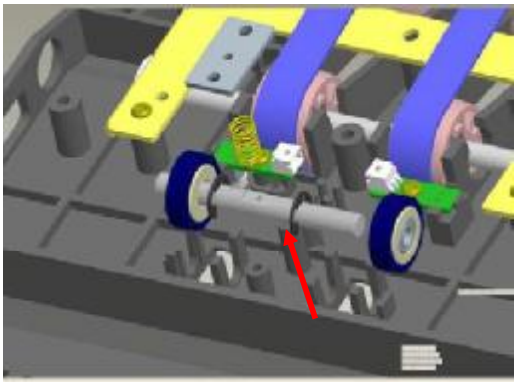




Unloose the screws to separate the GGL B/K-c, GGL spring and GGL shaft rollers.







## 3.10. Base Framework Part

Transfer Plate Part consists of Side Framework Part and Bottom Framework Part.

### Transfer Plate Part

<table>
<tr><th colspan="2">Part</th><th>Ass'y</th></tr>
<tr><td rowspan="10">Side Framework Part</td><td colspan="2">Divert Ass’y</td></tr>
<tr><td colspan="2">Baffle Plate</td></tr>
<tr><td rowspan="4">Left Side Framework Part</td><td>Main motor</td></tr>
<tr><td>Clutch</td></tr>
<tr><td>Solenoid</td></tr>
<tr><td>External PCB</td></tr>
<tr><td rowspan="6">Right Side Framework Part</td><td>Brake</td></tr>
<tr><td>Encoder interrupt Ass’y</td></tr>
<tr><td>Kicker Roller Interrupt Ass’y</td></tr>
<tr><td>Main board</td></tr>
<tr><td>Main board Cover</td></tr>
<tr><td>Driver board</td></tr>
<tr><td>Bottom Framework Part</td><td colspan="2">SMPS</td></tr>
</table>

## Transfer Plate Part Contents

**3.10.1. Divert Ass'y**

**3.10.2. Baffle Plate**

**3.10.3. Main motor**

**3.10.4. Clutch**

**3.10.5. Solenoid**

**3.10.6. External PCB**

**3.10.7. Brake**

**3.10.8. Encoder interrupt Ass'y**

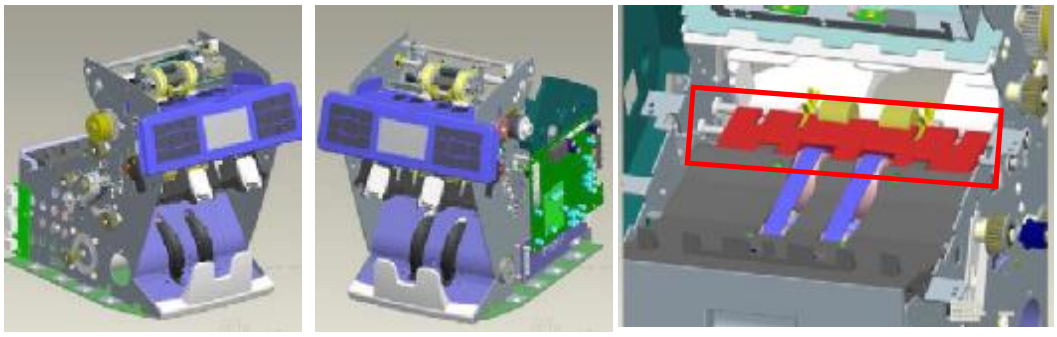
**3.10.9. Kicker Roller Interrupt Ass'y**

**3.10.10. Main board, Driver board, PCB Cover**

**3.10.11. SMPS**

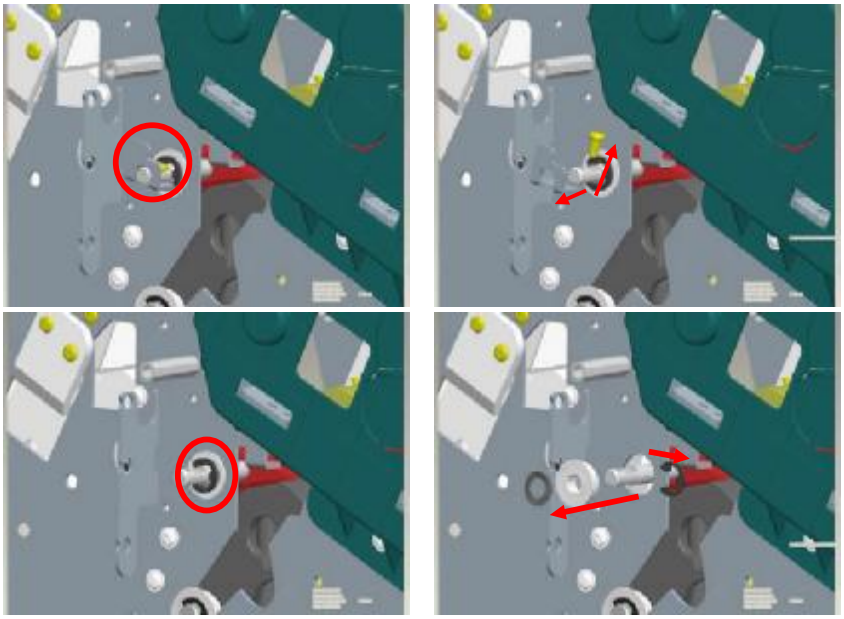
## 3.10.1 Disassemble Divert Assy

A. Remove Hopper cover, side covers, main board, CIS assy and GGT Assy before you remove the Divert Assy.

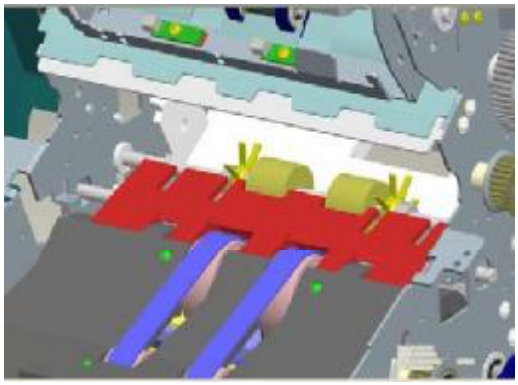


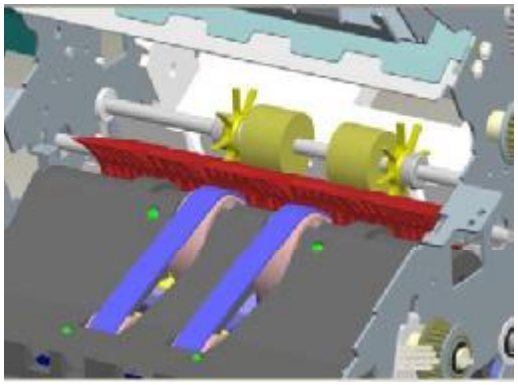
B. Remove the E-rings on the left side framework.

C. Remove the E-rings and the screw on the right side framework.

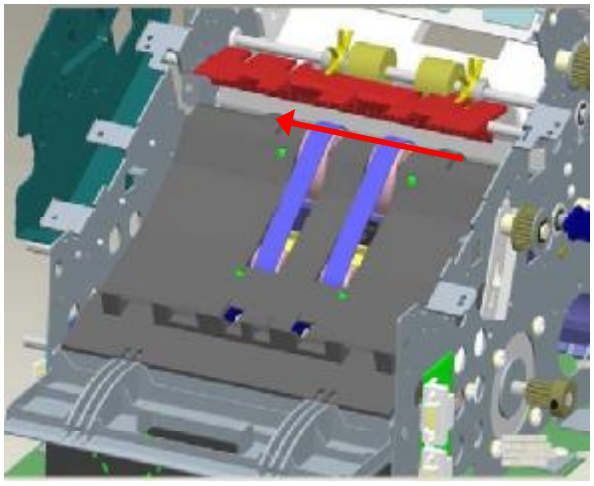


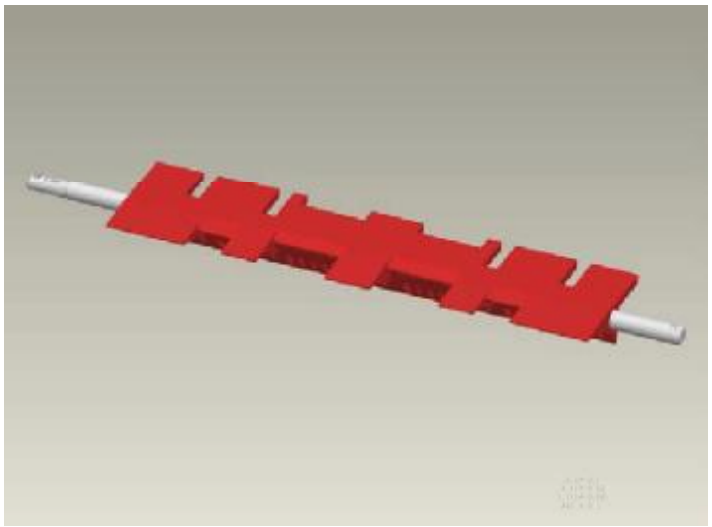
D. Lift up the Divert Assy.





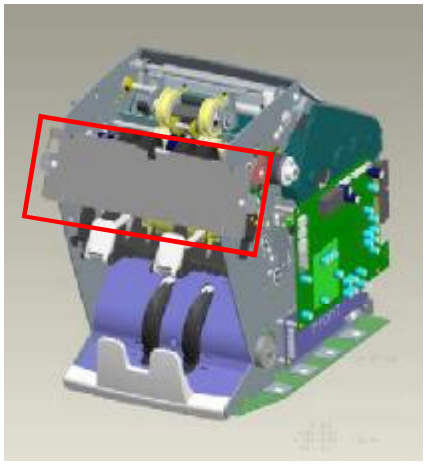
E. Slide left to remove.



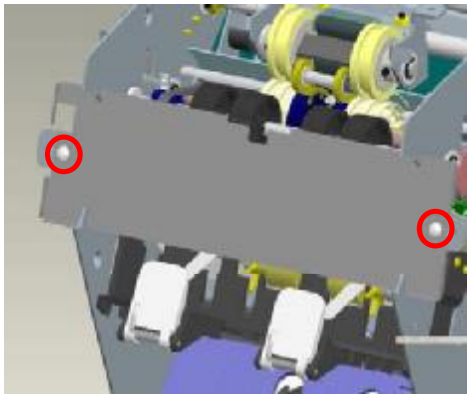


## 3.10.2 Disassemble Baffle Plate

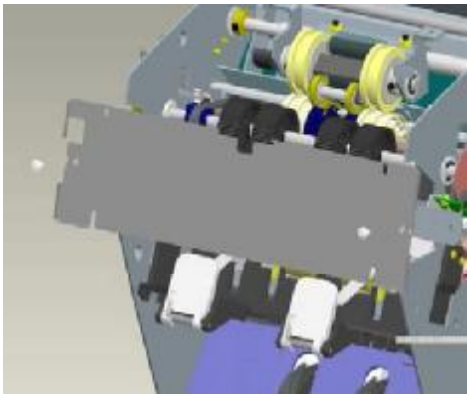
A. remove Hopper cover and display part before you remove the Baffle Plate.



B. there are two screws at the front.



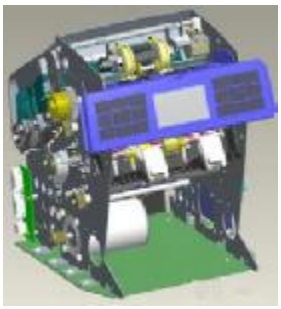
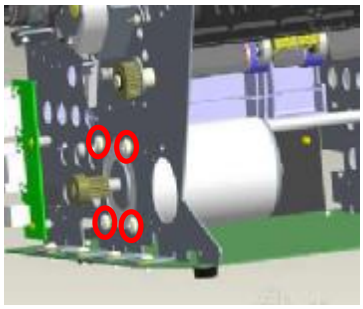
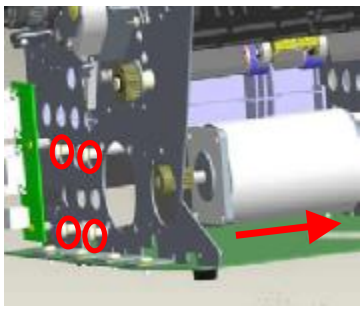
C. Unloose the screws.



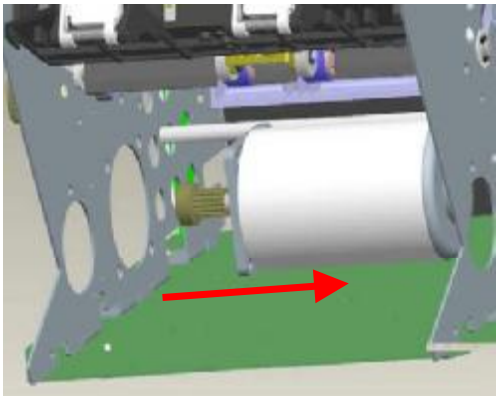
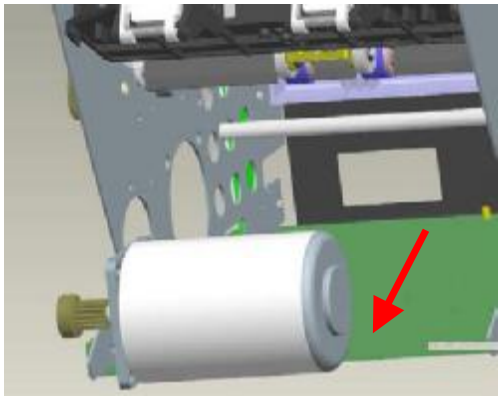
## 3.10.3 Disassemble Main motor

Remove cover part, stacker part and SMPS first. _

A. Unloose the 4 screws on the left.

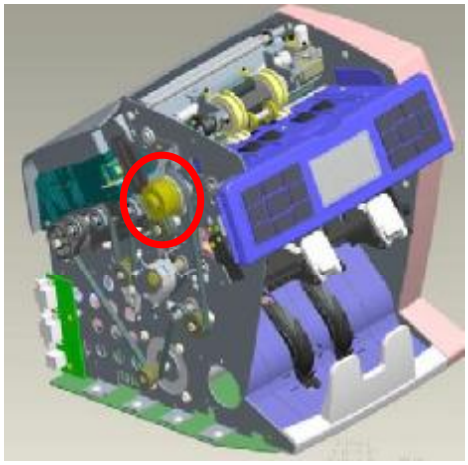




B. Pull right to remove.

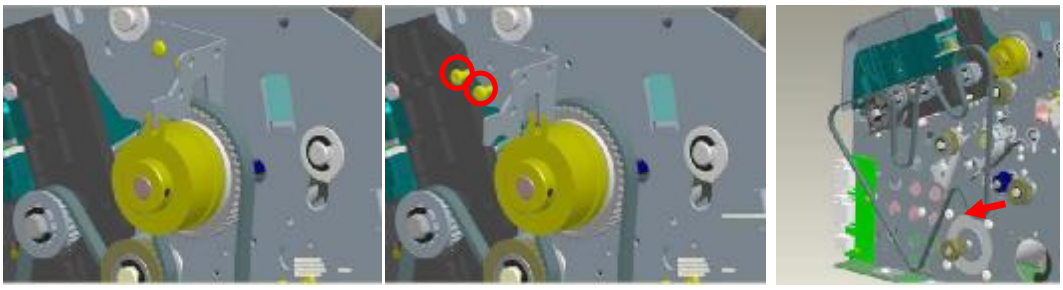



## 3.10.4 Disassemble Clutch

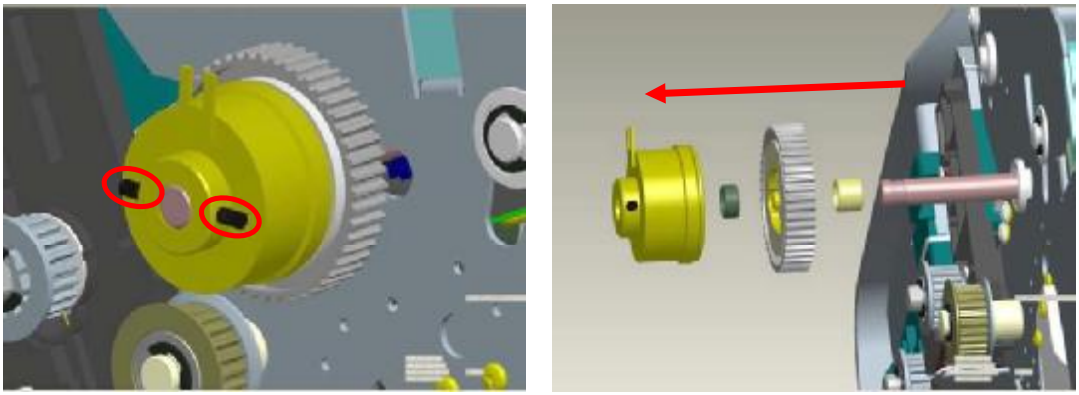
A. Remove the side covers before you remove the clutch.



B. Remove the belt guide bracket before you remove the belt.



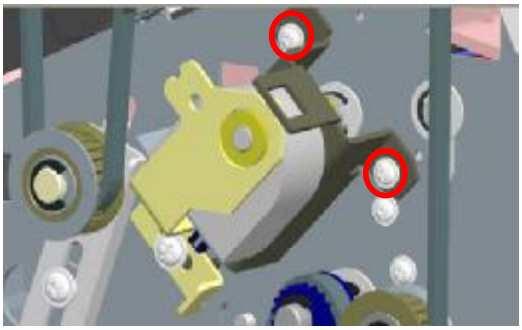
C. Unloose the stripper bolts in the clutch.

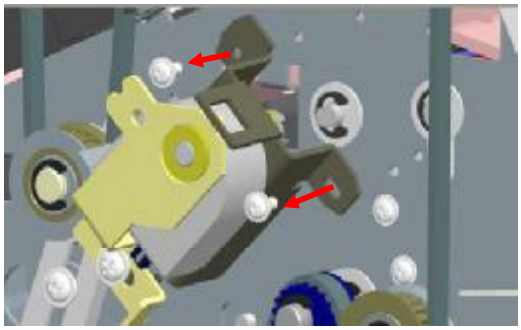


## 3.10.5 Disassemble Solenoid

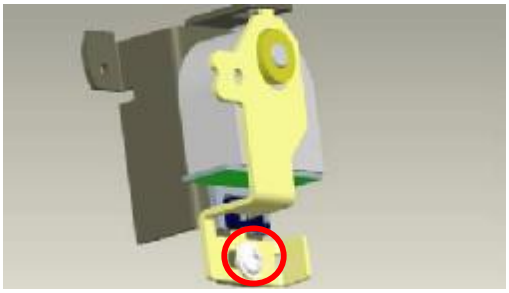
Remove Left-side cover first.

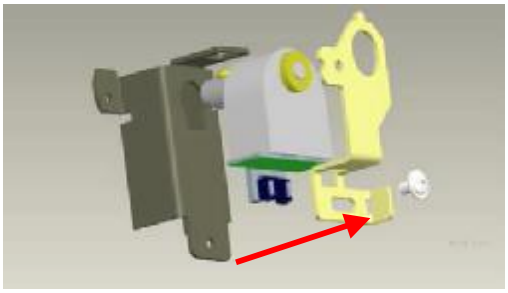
A. Unloose the screws at the solenoid.



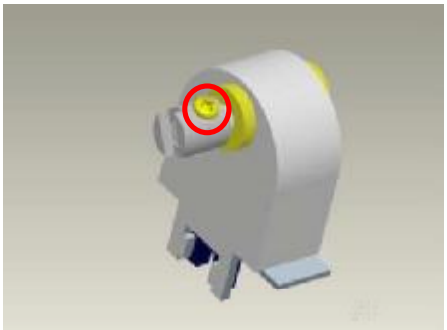


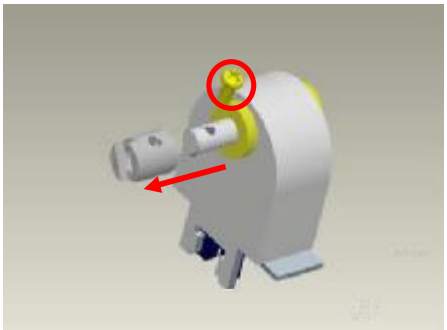
B. Unloose the screw to separate the SWG bracket from the SWG selector.





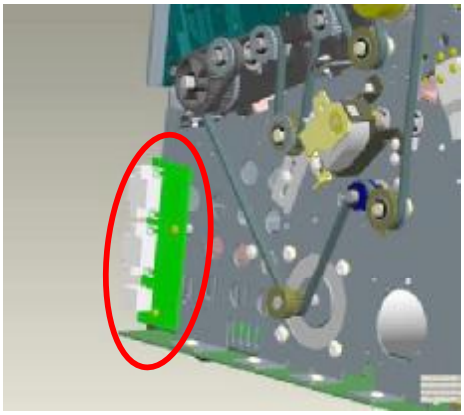
C. Unloose the screw to remove the Spacer Swing Selector.



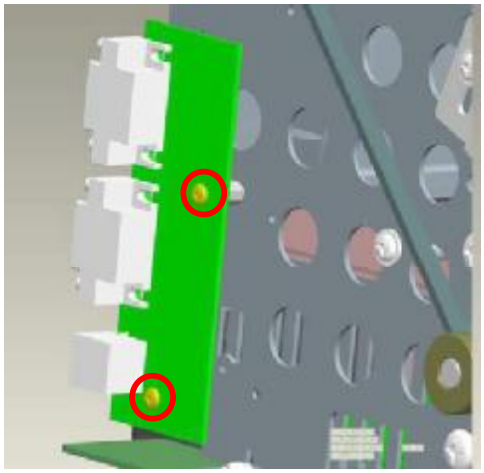


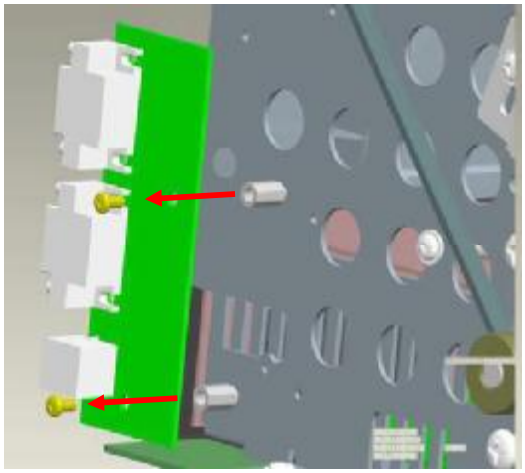
## 3.10.6 Disassemble External PCB

A. Remove left side cover.



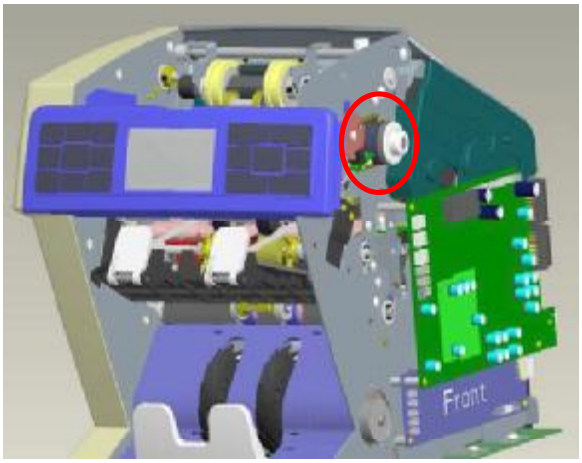
B. Unloose the 2 screws to remove the External PCB.



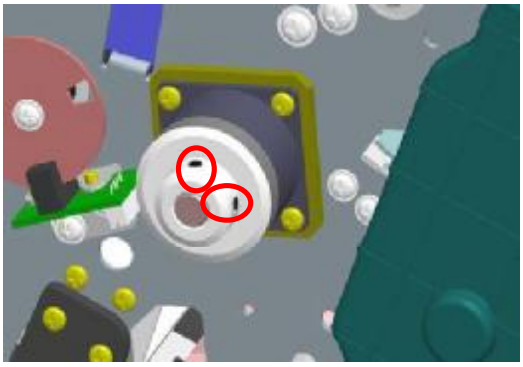


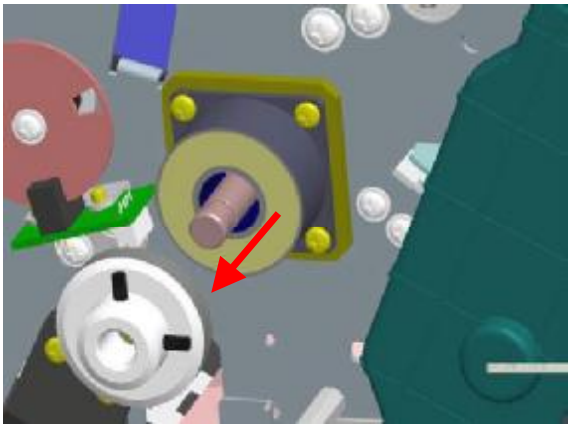
## 3.10.7 Disassemble Brake

A. Remove right side cover.

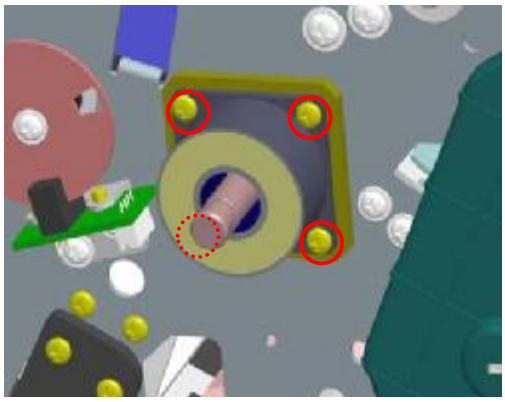


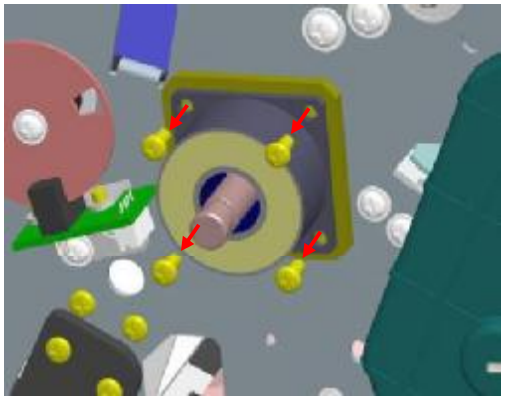

B. unloose the stripper bolts on the brake.

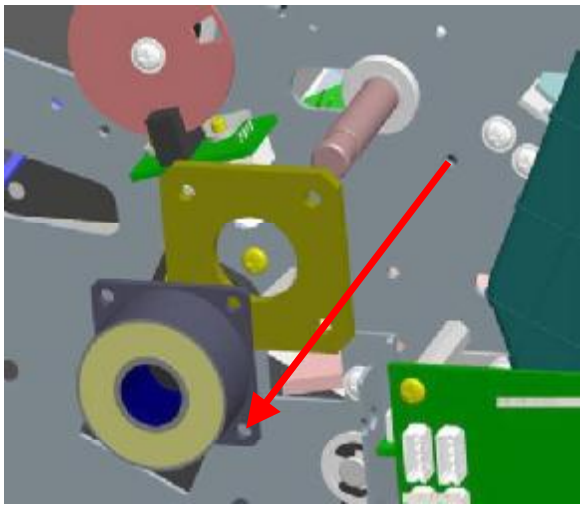




C. Unloose the 4 screws at the bottom.

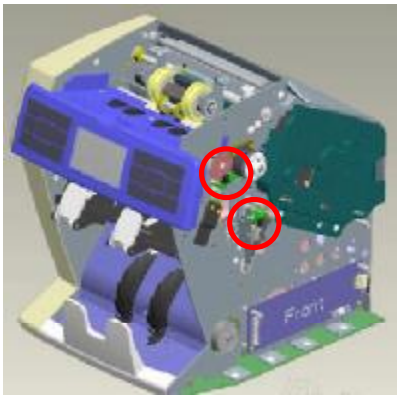


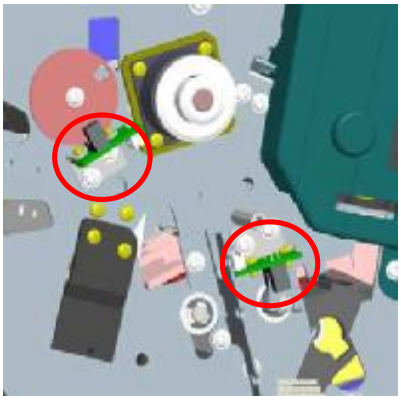




## 3.10.8 Disassemble Interrupt Assy

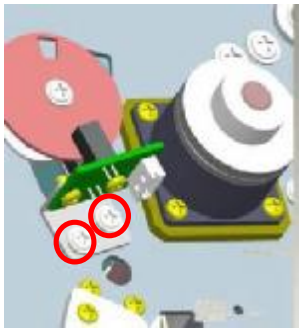
A. Remove right side cover and main board before you remove the Encoder interrupt assy.

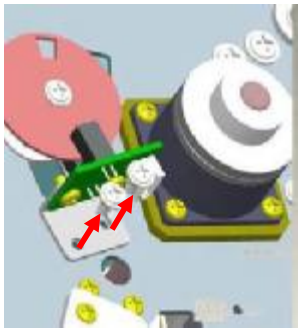


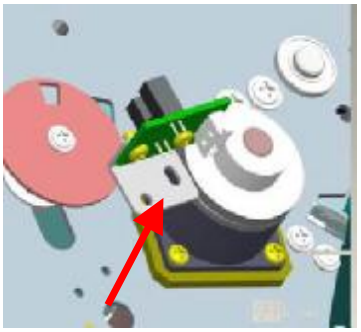


B. Unloose the screws on the right side framework to remove the Encoder Interrupt assy.

C. Unloose the screws on the right side framework to remove Kicker Roller Interrupt Assy.

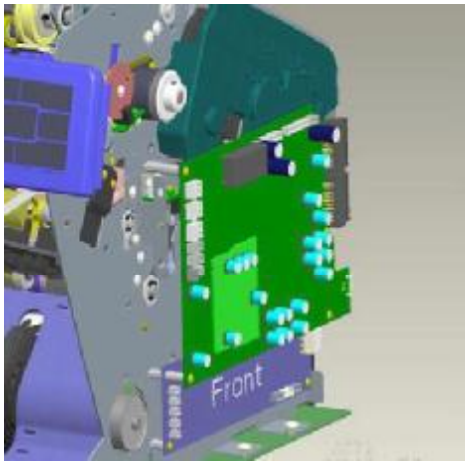




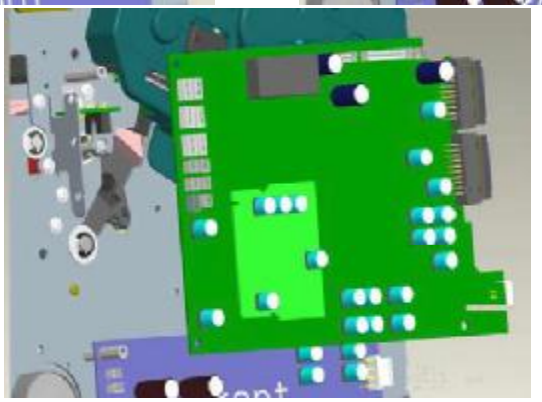


## 3.10.9 Disassemble Main board, Driver Board and PCB cover

A. Remove right side cover.

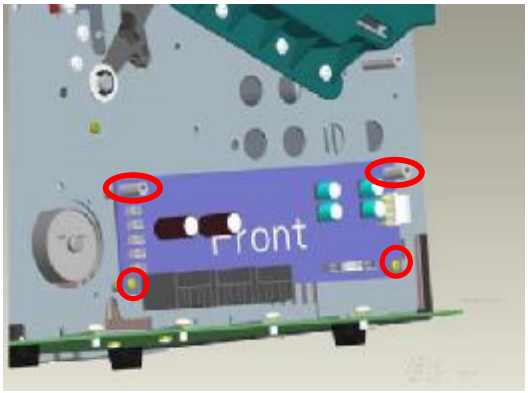


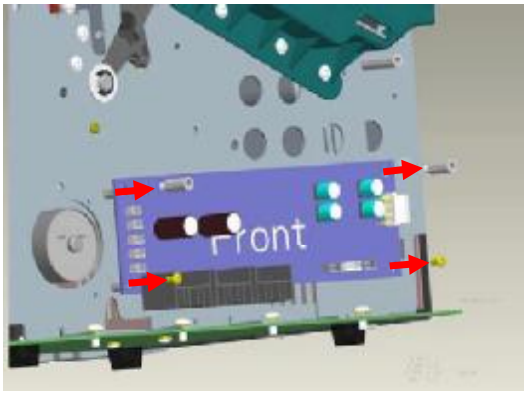

B. Unloose the 4 screws on the mainboard.

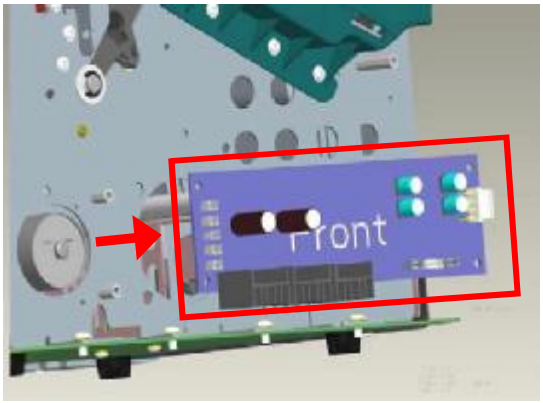


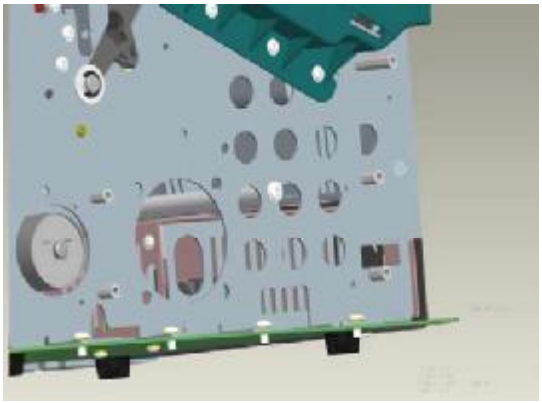
C. You have to remove the mainboard first before you remove the driver board.

D. Unloose the screws on the driver board.

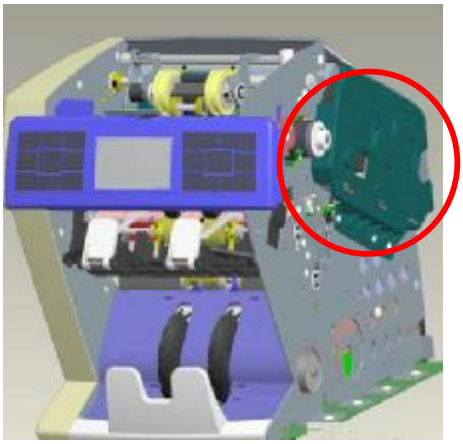


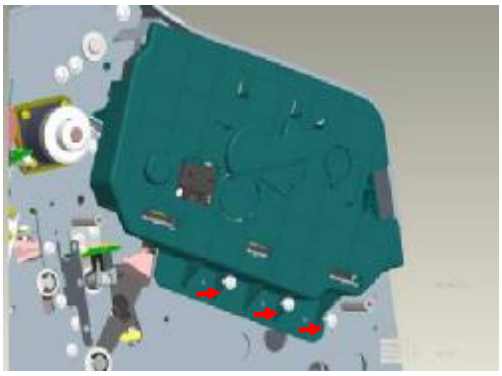



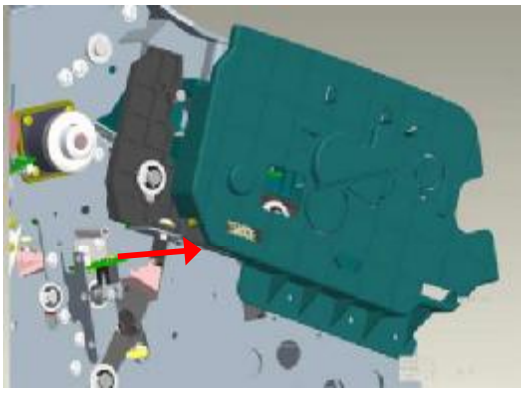
A. Remove mainboard first before you remove the PCB cover.

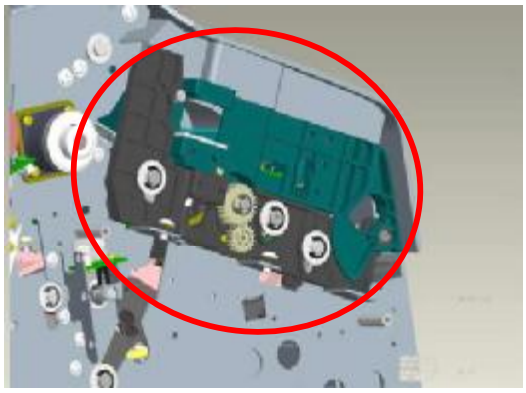


B. Unloose the screws on the PCB cover.



C. Remove the cover.



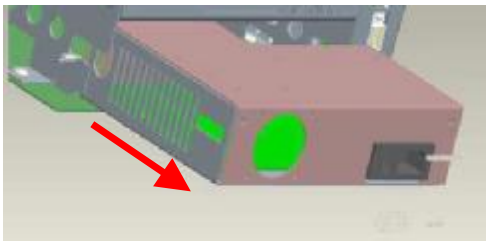


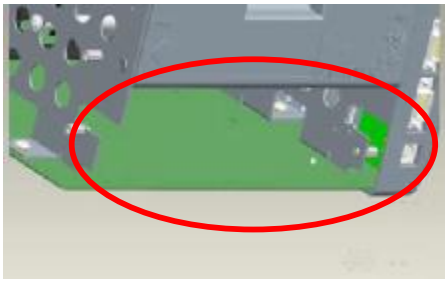
## 3.10.10 Disassemble SMPS

A. Remove the rear bottom cover.

B. Unloose the screws at the bottom framework.

C. Pull out to remove SMPS.





## 3.11. Electronic Part

Electronic Part consists of Main Board, Driver Board, Top PCB, Bottom PCB, Display PCB and Power (SMPS).

**Electronic Part**

| | |
|---|---|
| Electronic Part | Main Board |
| | Driver Board |
| | GCT Board |
| | GCL Board |
| | Display Ass'y |
| | Power (SMPS) |

**Electronic Part Contents**

### 3.11.1. Main Board

### 3.11.2. Driver Board

### 3.11.3. GCT Board

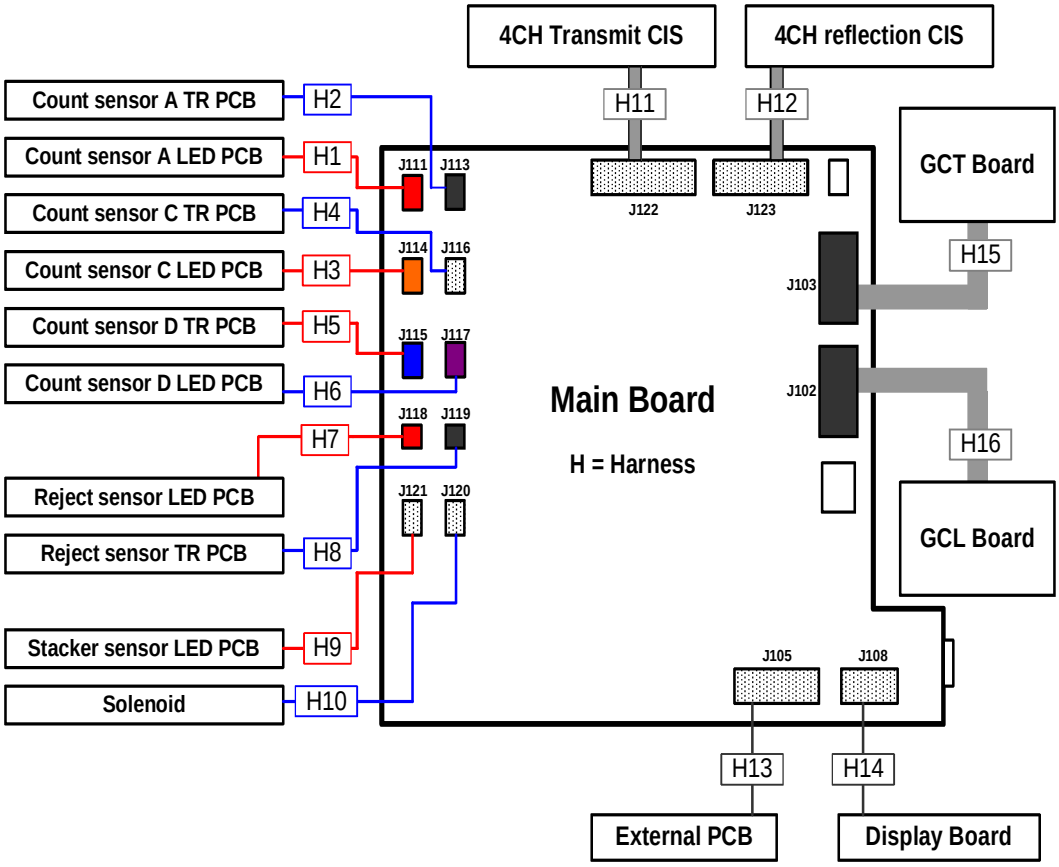
### 3.11.4. GCL Board

### 3.11.5. Display Ass'y

### 3.11.6. Power (SMPS)

## 3.11.1. Main Board

Main board controls electronic Acurators and processes the data collected at recognition modules after transferring of the banknotes.




**<Figure 3.1 Main Board>**

Harness 1,2,3,4,5,6,9 use 4 pin Connector and connect from the main board and the other ends go to each sensors. Shorter ends go to the left sensors and longer ends go to right sensors.

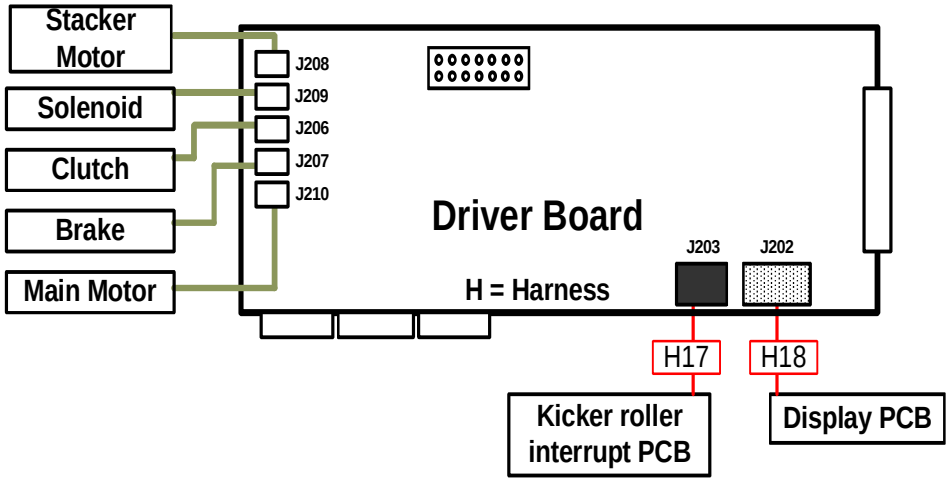
- Harness 11, 12 use 13 pin connector.
- Harness 15, 16 use 20 pin connector.

**<Table 3.1 Main Board Harness connection>**

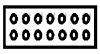
| Harness number | connector housing | Connecting PCB name | Figure |
|---|---|---|---|
| H1 | J111 | Count sensor A LED PCB | |
| H2 | J113 | Count sensor A TR PCB | |
| H3 | J114 | Count sensor C LED PCB | |
| H4 | J116 | Count sensor C TR PCB | |
| H5 | J115 | Count sensor D LED PCB | |
| H6 | J117 | Count sensor D TR PCB | |
| H7 | J118 | Reject sensor LED PCB | |
| H8 | J119 | Reject sensor TR PCB | |
| H9 | J121 | Stacker sensor PCB | |
| H10 | J120 | Solenoid | |
| H11 | J122 | 4CH Reflection CIS | |
| H12 | J123 | 4CH Transmit CIS | |
| H13 | J105 | External PCB | |
| H14 | J108 | Display Board | |
| H15 | J103 | GCL Board | |
| H16 | J102 | GCT Board | |

## 3.11.2. Driver Board

The driver board controls motors, clutch, brake, spool mortor and solenoid by receiving signals from the main board.




**<Figure 3.2 Driver Board>**



J201 connector is directly connected to the mainboard.

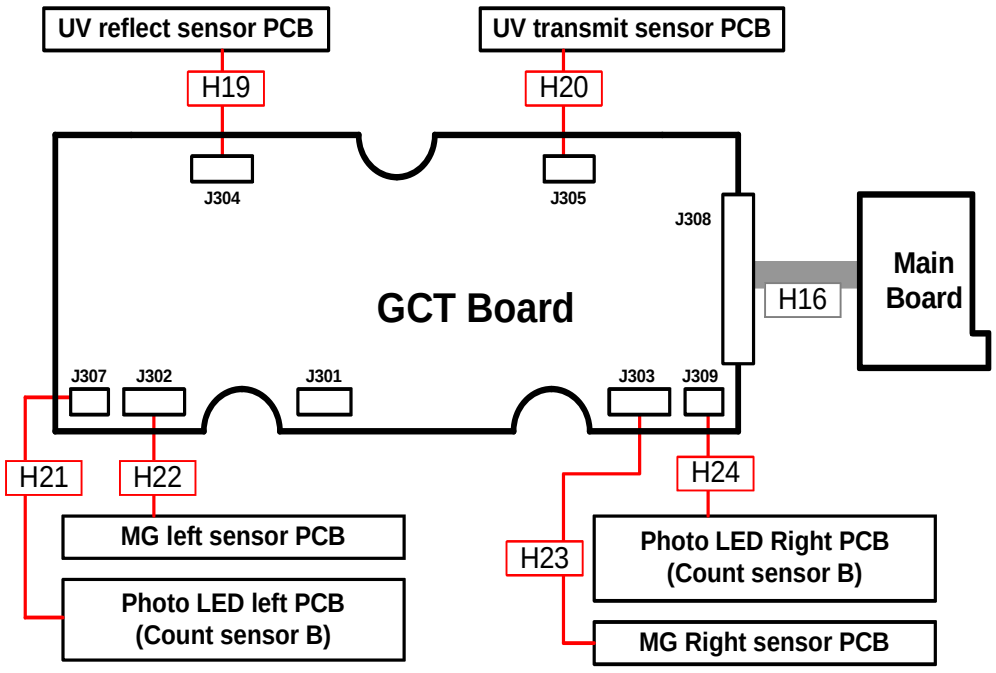
J206~J201 connects to stacker motor, solenoid, clutch, brake and main motor.

**<Table 3.2 Driver Board and PCB Figure>**

| Connecting PCB name | Figure |
|---|---|
| Kicker roller interrupt PCB | |
| Display Board | |

### 3.11.3. GCT Board

GCT board connects to the reflect CIS sensors, MG sensors and UV sensors.



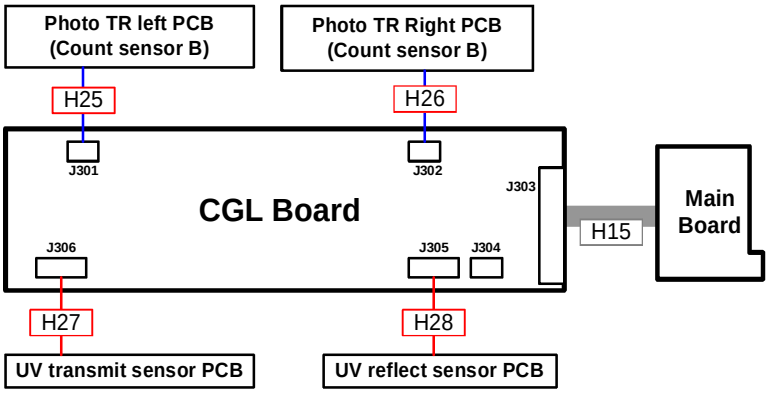

**<Figure 3.3 GCT Board>**

**<Table 3.3 GCT Board Harness Connection>**

| Harness number | connector housing | Connecting PCB name | Figure |
|---|---|---|---|
| H19 | J304 | UV Reflect Sensor PCB | |
| H20 | J305 | UV Transmit Sensor PCB | |
| H21 | J307 | Photo LED Left PCB (Count sensor B) | |
| H22 | J302 | MG Left Sensor | |
| H23 | J309 | Photo LED Right PCB (Count Sensor B) | |
| H24 | J303 | MG Right Sensor PCB | |
| H16 | J102 | Main board | |

## 3.11.4. CGL Board

GCL board connects to the Transmit and refeclt UV sensor and counter sensors.



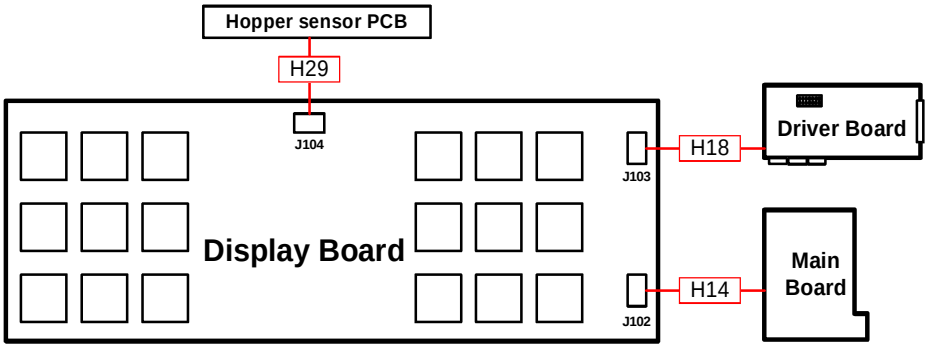

<Figure 3.4 CGL Board>

**<Table 3.4 GCL Board Harness Connection>**

| Harness number | connector housing | Connecting PCB name | Figure |
|---|---|---|---|
| H25 | J301 | Photo TR Left PCB (Count sensor B) | |
| H26 | J302 | Photo TR Right PCB (Count sensor B) | |
| H27 | J306 | UV Transmit Sensor PCB | |
| H28 | J305 | UV Reflect Sensor PCB | |
| H15 | J103 | Main board | |

## 3.11.5. Display Board

Display board consists of Key pads and LCD display. Main CPU is Atmega32.



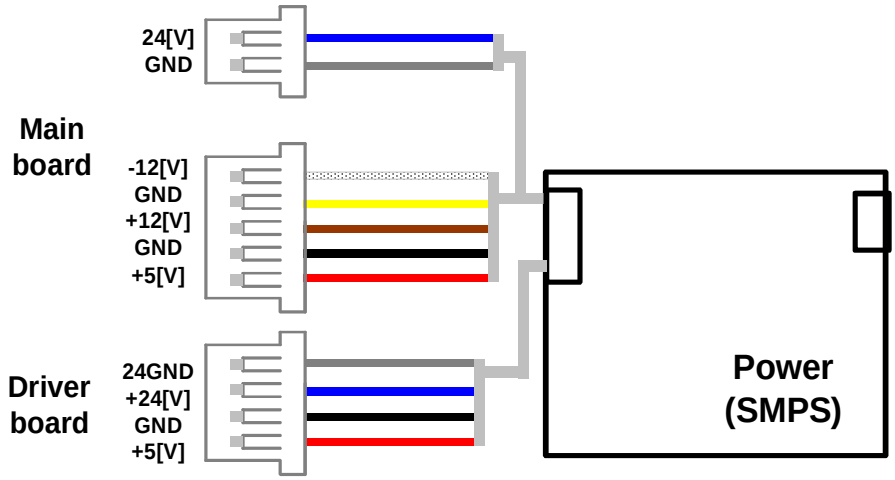

<Figure 3.5 Display Ass'y>

**<Table 3.5 Display Ass'y and PCB Figure>**

| Connecting PCB name | Figure |
|---|---|
| Hopper sensor PCB | |
| Driver board | |
| Main board | |

## 3.11.6. Power (SMPS)

Power supply supplies DC power to the main board and the driver board.




2 pin connector connects to the main board J110 connector and supply 24 V DC.

5 pin connector conects to the main board J109 connector.

4 pin connector connects to the driver board.

# 5. Electronic Setting

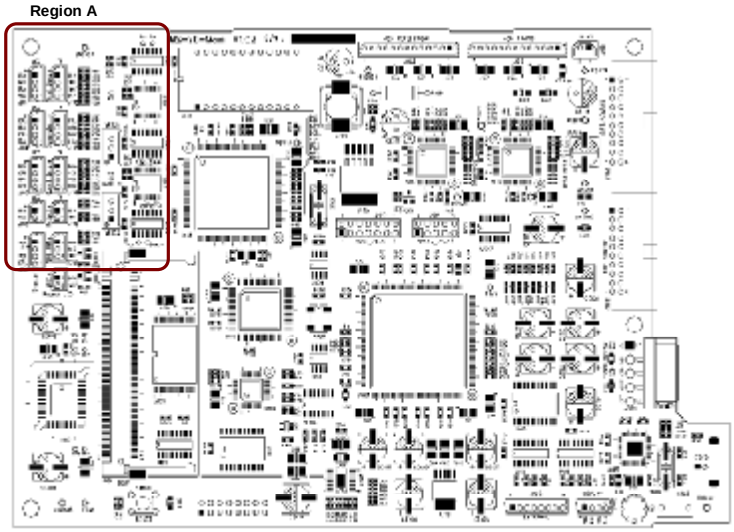
**This section explains how to adjust Hopper, Reject and Stacker Sensor of SB-2000 machine.**

### 5.1. Reject Sensor, Stacker Sensor Setting

### 5.2. Hopper Sensor Setting

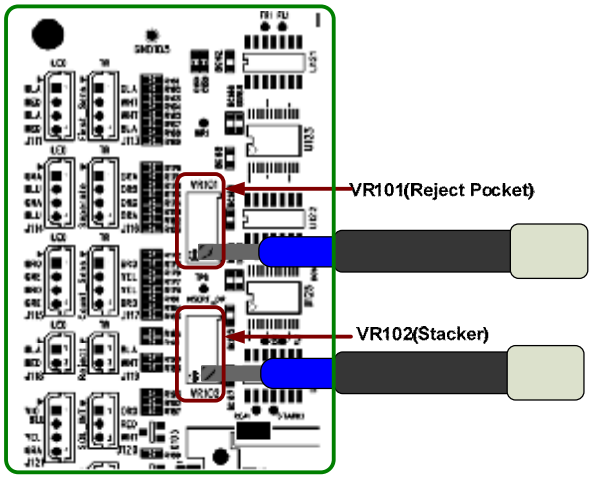
## 5.1. Reject Sensor, Stacker Sensor Setting

Please use Potentiometer of Region A marked on left side of the main board <figure 5.1.1> to adjust Stacker Sensor and Reject Sensor. <Figure 5.1.2> is an enlarged picture of <figure 5.1.1>. <Figure 5.1.2> is to show the position of Potentiometers that need to be adjusted .VR101 controls the sensitivity of Reject Sensor. VR102 controls sensitivity of Stacker Sensor.



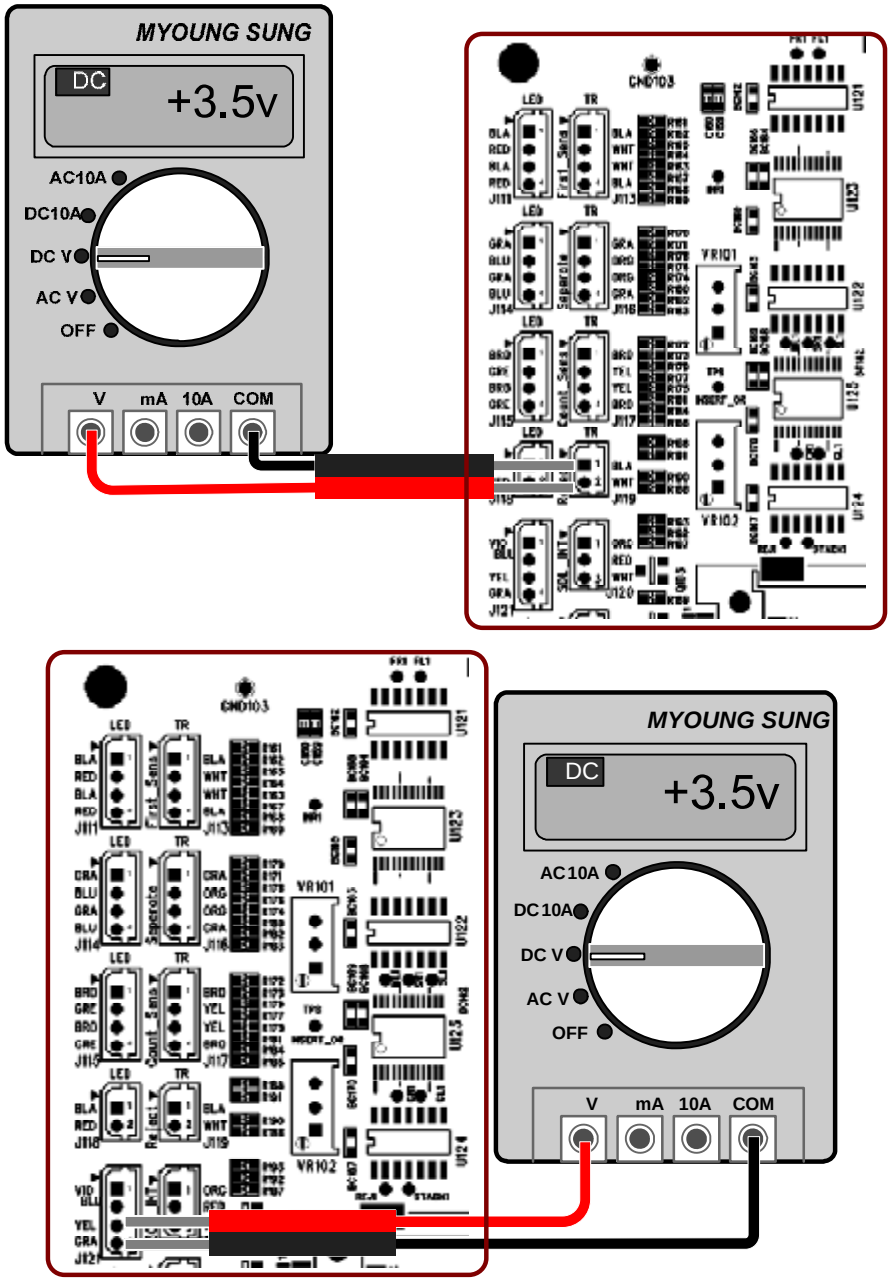

**<Figure 5.1.1 Main board>**

During adjustment, when the below potentiometers are turned clockwise rotation, the sensitivity increases. When they are turned counter-clock direction, sensitivity decreases.




**<Figure 5.1.2 Position for adjusting** Potentiometer **>**

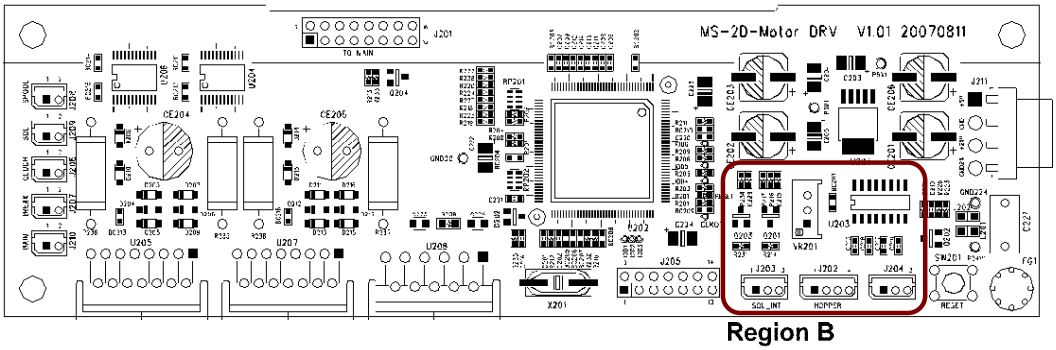
<Figure 5.1.3> shows how to measure sensitivity of sensor using a DC-Voltage Meter. To measure voltage, please measure No 1, and 2 point on J119 connector and No 3 and 4 point on J121 connector while banknotes are placed in Reject Pocket and Stacker respectively. To optimize sensitivity of sensor, please make sure voltage is set to 3.5 volt on the potentiometer.




**<Figure 5.1.3 to measure power voltage of sensor>**

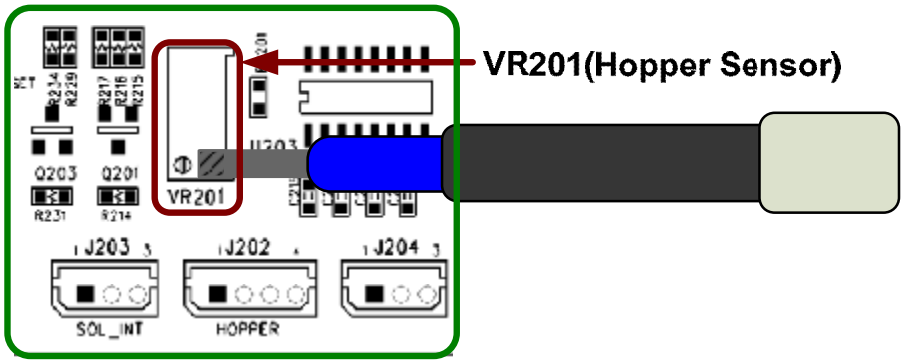
## 5.2. Hopper Sensor Setting

To adjust Hopper Sensor, locate Potentiometer of Region B section marked at the right bottom of the driver board of (figure 5.2.1). Here Figure 5.2.2 is enlarged part of figure 5.2.1. This picture is to show the position of the Potentiometers that need to be adjusted.



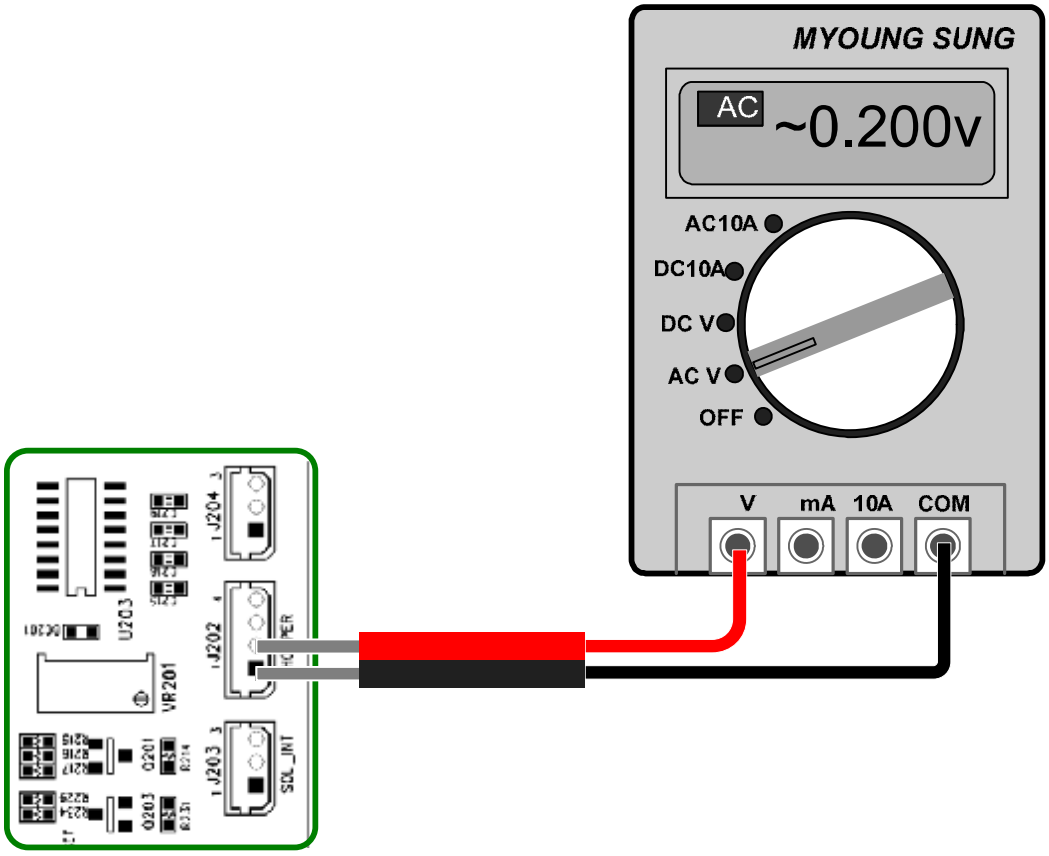

**<figure5.2.1 driver board>**

During adjustment, when the below potentiometers are turned clockwise rotation, the sensitivity increases. When they are turned counter-clock direction, sensitivity decreases.




**<Figure 5.2.2. Hopper Sensor Position of Potentiometer for adjustment>**

<Figure 5.2.3> To set the AC voltage of the hopper sensor, first switch meter to AC voltage mode (AC V) and measure voltage on point 1 and 2 of J202 connector as shown in figure 5.2.3 while banknote is placed on the Hopper Sensor. To optimize sensitivity of sensor, voltage should be set to 0.20V AC.




**<Figure 5.2.3** Measurement of Hopper sensor's power voltage>

# 6. Mechanical Setting

**Service Technician must test the operation of SB-2000 through setting of SB-2000.**
**This section describes how to adjust Brake, Clutch, Hopper Thickness Ass'y and Solenoid component of SB-2000.**

**6.1. Brake Setting**

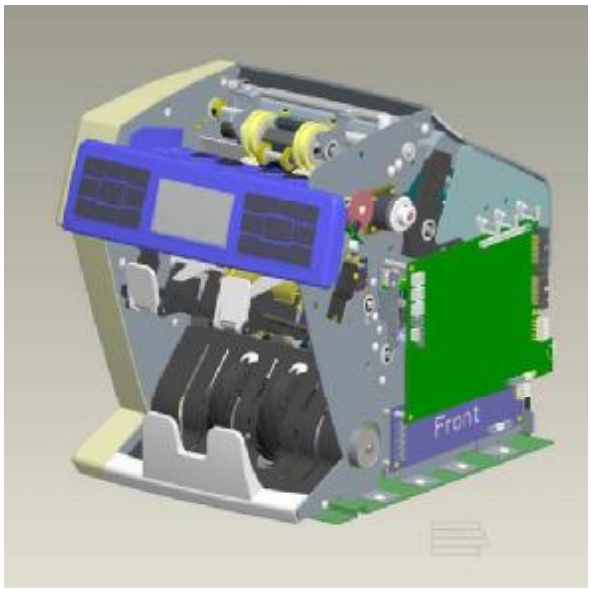
**6.2. Clutch Setting**

**6.3. MG Center Sensor's height adjustment**

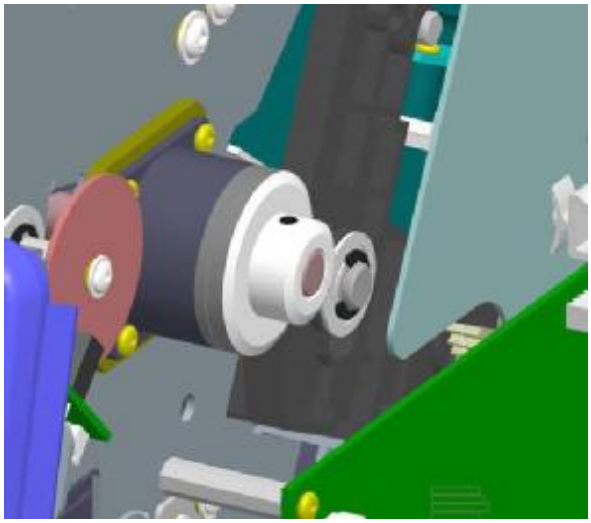
**6.4. Hopper Part, Thickness Assembly's adjustment**

## 6.1. Brake Setting

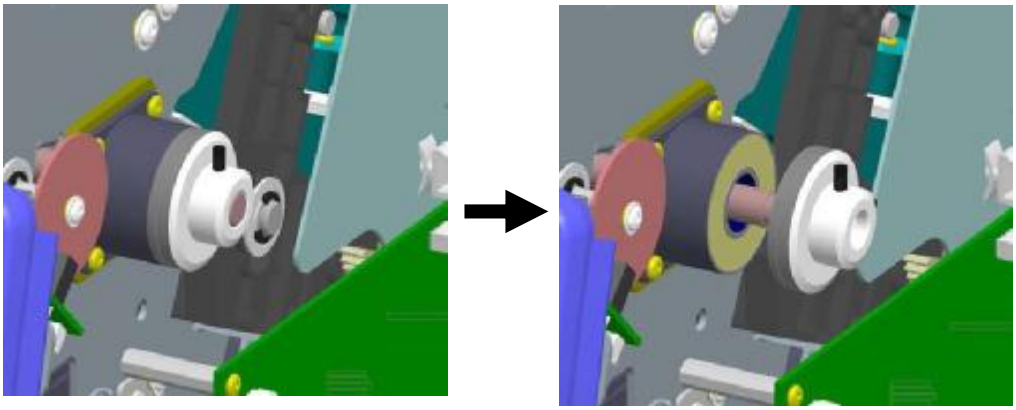
A. Disassemble Hopper Cover and Right Side Cover as shown at the below picture.



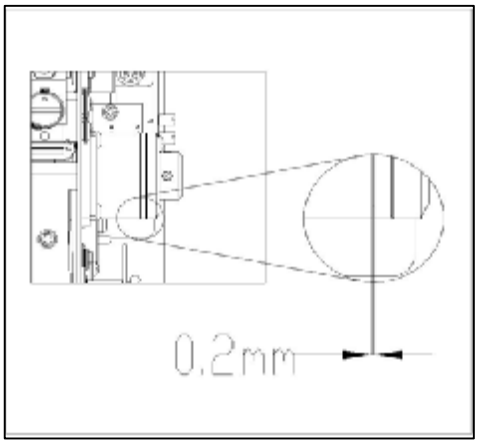

B. Brake is composed of Brake body and Brake friction disk. It works electrically. Disk and Body maintain regular interval and rotation is stopped by electromagnetic force while electromagnet in operation.

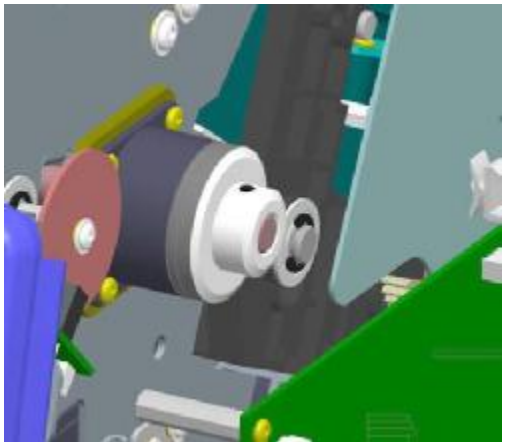


C. To disassemble disk from feed shaft, unscrew 2 qm3x4 Set Screw connected with Friction disk.



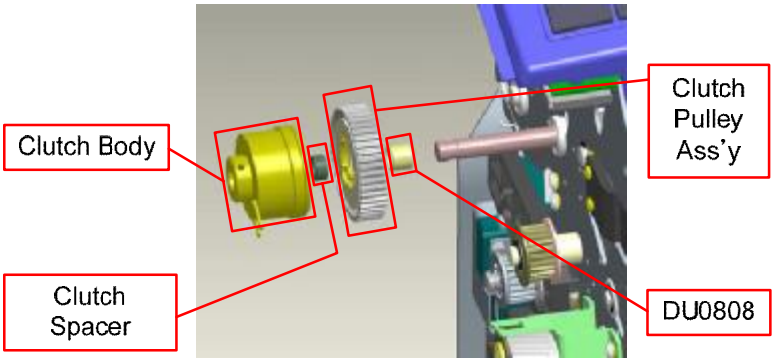
D. To fix disk on feed shaft, screw 2 qm3x4 Set Screw as shown at the right picture keeping condition of interval in 0.2mm between brake body and friction disk as shown at the left drawing.



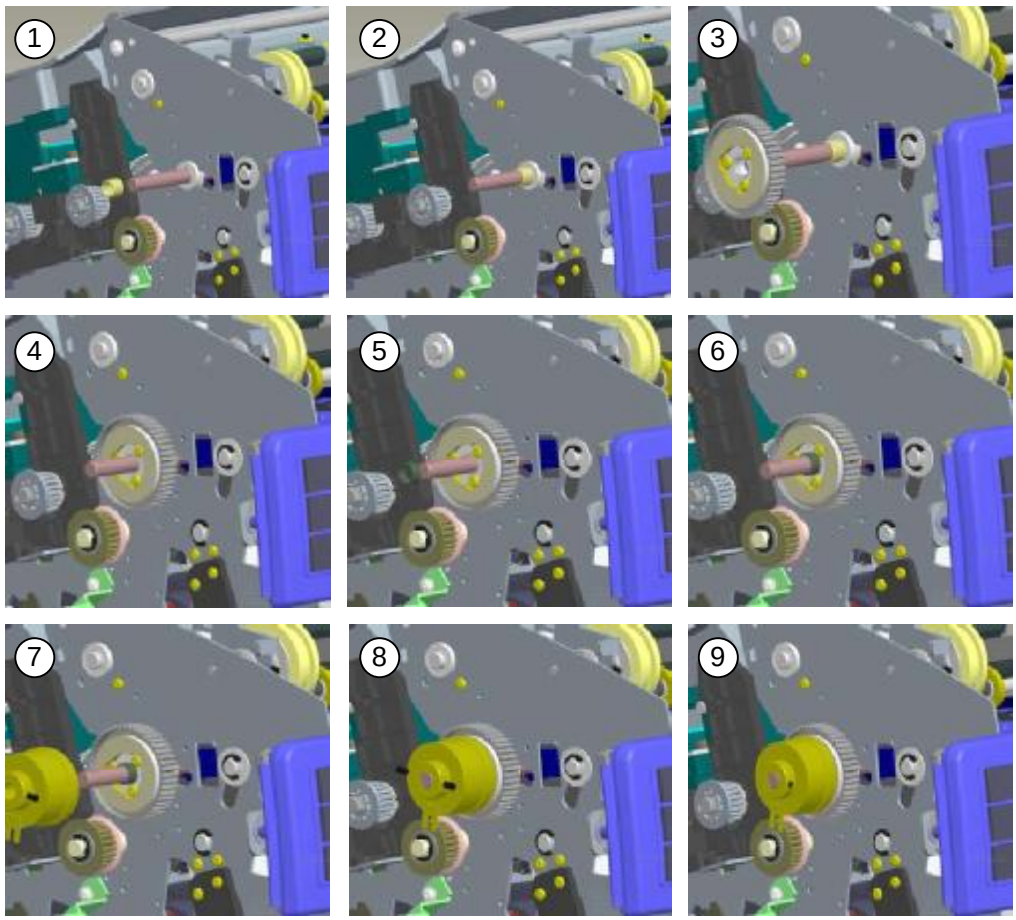



## 6.2. Clutch Setting

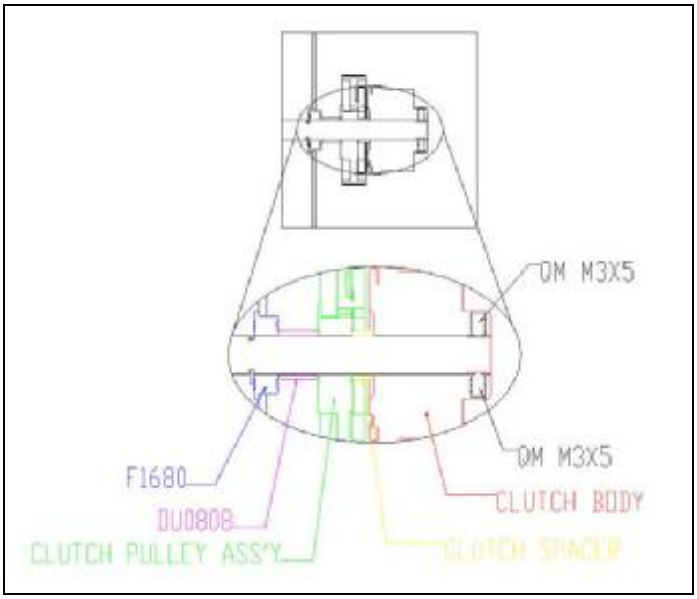
A. Please disassemble clutch as shown at the below picture.



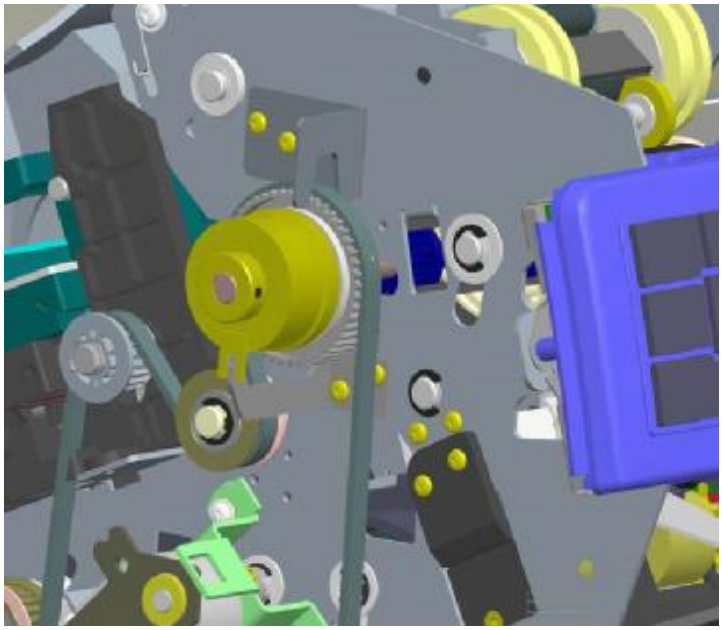

B. Please assemble DU0808, Clutch Pulley Ass'y, Clutch Spacer, and Clutch Body accordingly.



C. Please assemble Clutch separate from other parts accordingly as show at the below diagram and make sure no interval exists. And then, please fix clutch body on fixed shaft screwing 2 Set Screw.

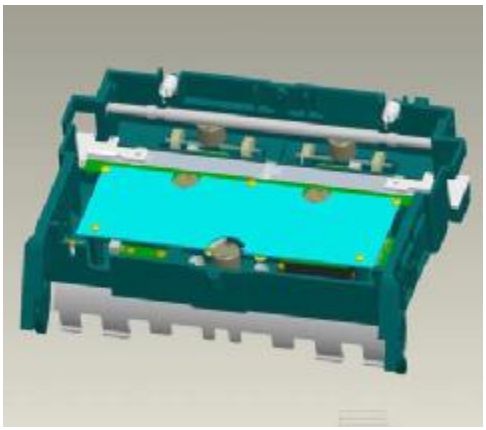


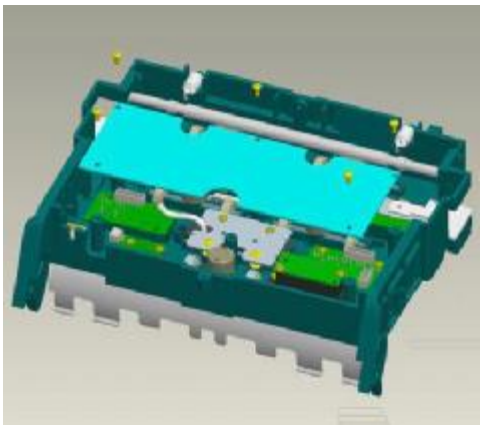

D. When Clutch is assembled, please assemble belt, Clutch Bracket, Guide DB Belt Bracket as shown in the below picture. Next, please check if Feed Roller and Kick Roller move freely on the working belt (used hand to turn around).



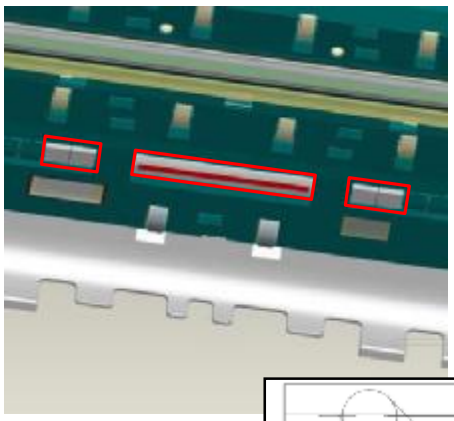
### 6.3. MG Center Sensor's height adjustment

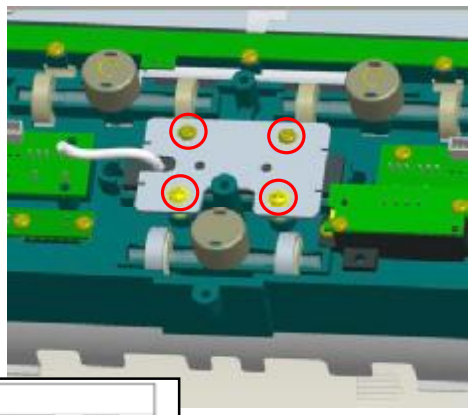
A. Please disassemble Top PCB of Upper Discrimination Module.

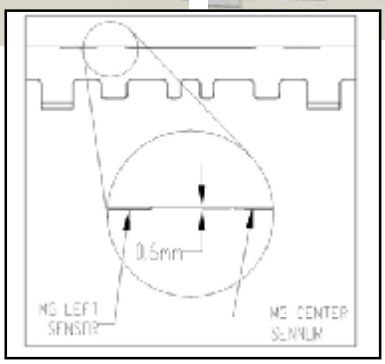




B. A MG Center Sensor and a both side of MG sensor's height must be same. The height is about 0.6 mm from Upper Discrimination Body. Follow the below pictures and illustration on how to adjust screw bolts or unscrew to adjust height or placement as marked on the below pictures. Note that standard model SB-2000 only equipped with center MG sensor.



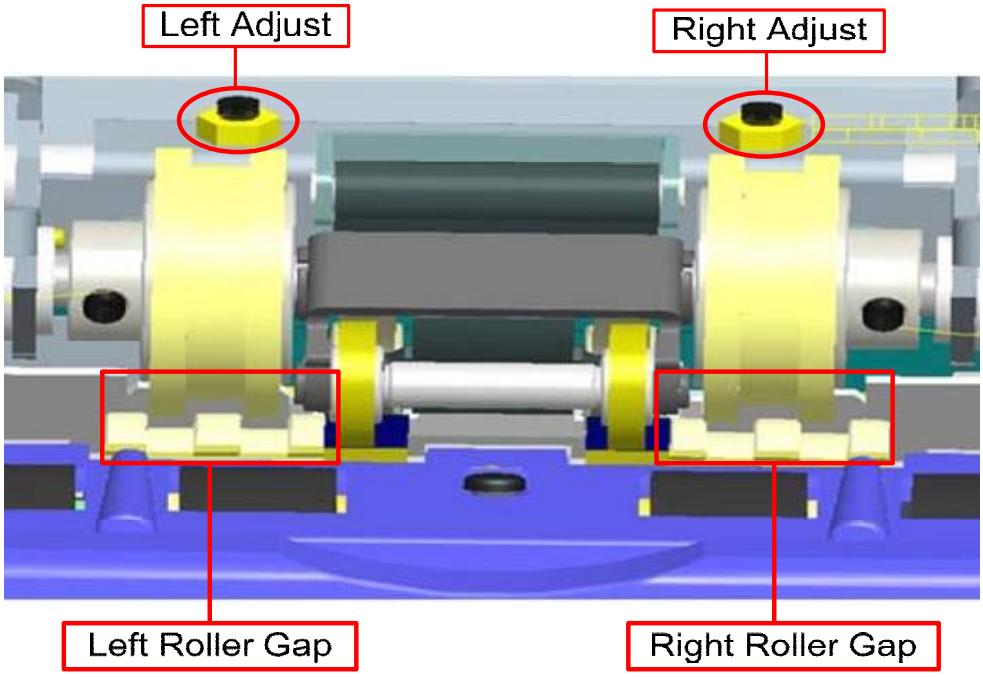




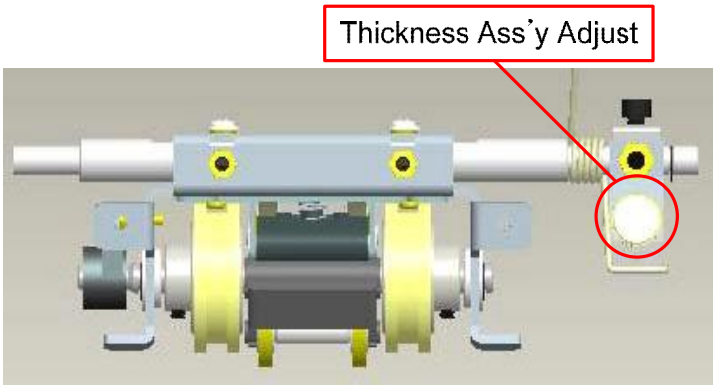
### 6.4. Hopper Part, Thickness Assembly's adjustment

- In case "CHAIN ERROR" shows up frequently during counting, check the left and right roller and gap and make adjustment as necessary.

A. Please check whether REVERSE ROLLER moves to one side when you feed a new banknote between LEFT ROLLER GAP and RIGHT ROLLER GAP and roll the reverse roller. If either side is loose or stiff and not turning normally, please adjust it. Please adjust the gap, so that roller does not incline to one side (use Left Adjust Screw and Right Adjust Screw).



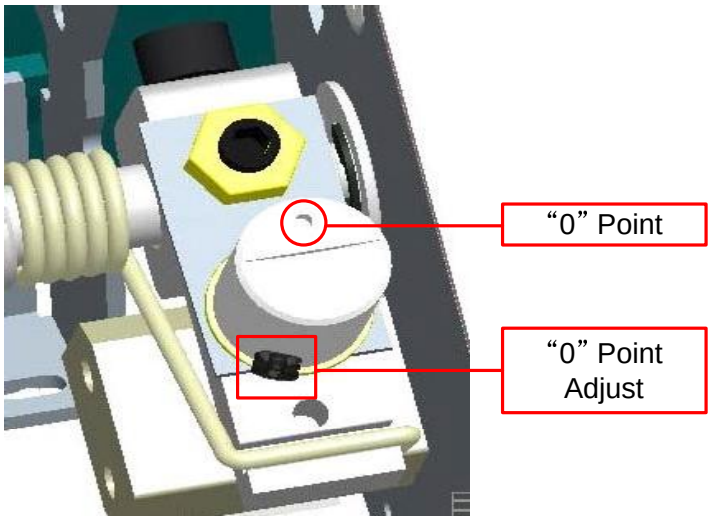

B. In case LEFT ROLLER GAP is loose more than RIGHT ROLLER GAP and vice-versa, unscrew NUT of LEFT or RIGHT ADJUST SCREW; Make them at the same gap level by moving bolts to clockwise. In case Horizontal gap between FEED ROLLER and REVERSE ROLLER is inclined to one side, please make both side gaps equal using bolts in order to fix REVERSE ROLLER.




C. When adjustment is done properly, both side gaps should be similar. When Thickness Ass'y ADJUST KNOB is adjusted to clockwise clock-wise little by little, LEFT ROLLER GAP and RIGHT ROLLER GAP become tighter.

D. Gap condition on both Left and right Roller GAP can be done as explained above. 0.05 ~0.08mm of GAP works the best for all conditions of banknotes.

E. After adjusting the Gap conditions properly and "0" position changes, then please adjust the thickness knob position to "0" using of "0" Point ADJUST screw as shown below.



# 7. Cause and troubleshoot:

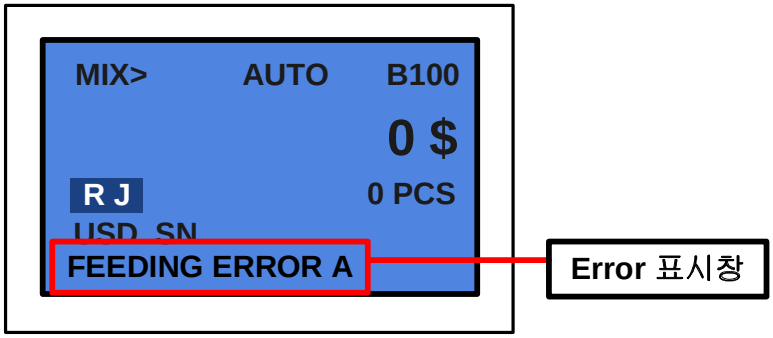
**During the operation of SB-2000, LCD display will show error messages or error codes on the screen when a problem occurs or operation gets interrupted.**
**Please find the cause of the problem and take necessary action according to section 7.1 and section 7.2.**

**Sensor Check**

**1. FEEDING ERROR A**
**2. FEEDING ERROR B**
**3. FEEDING ERROR C**
**4. SENSOR JAM A**
**5. SENSOR JAM B**
**6. SENSOR JAM C**
**7. SENSOR JAM D**
**8. STACKER ERROR**
**9. REJECT ERROR**

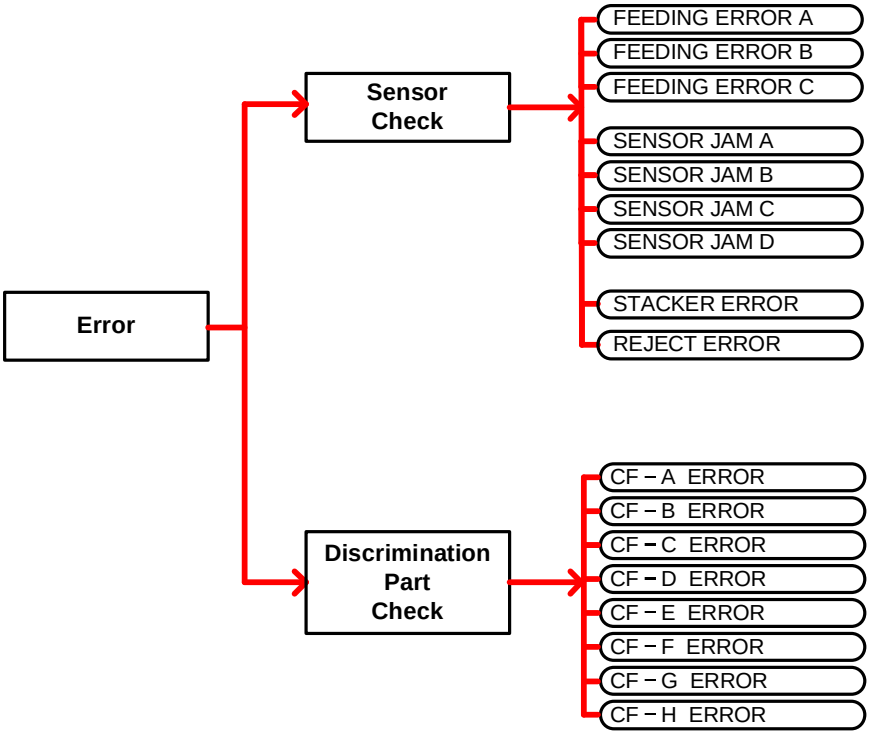
**Discrimination Part Check**

**10. CF-A ERROR**
**11. CF-B ERROR**
**12. CF-C ERROR**
**13. CF-D ERROR**
**14. CF-E ERROR**
**15. CF-F ERROR**
**16. CF-G ERROR**
**17. CF-H ERROR**



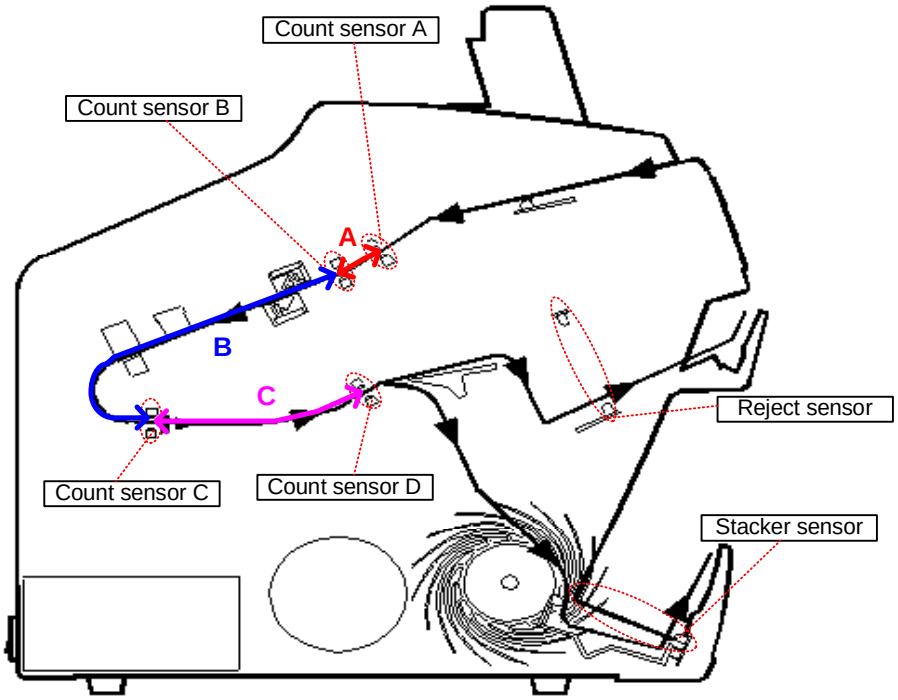

Display screen would show error message as illustrated above. After finding the error message or error codes on the display, please troubleshoot the problem and take action according to section 7.1 and 7.2 as described below:

Below is a flow-chart showing most error situation and cause of the error.
Please refer to below flow-chart:




**<Figure 7.1 Action Flow chart for Error messages >**

- When machine is interrupted for any reasons, please check the error message on the display screen and then determine the cause of Error and action plan.
- Please refer to section 3.3 on how to disassemble and assemble a replacement parts.
- Please refer to section 5.3 (Sensor checking) in case you need to adjust any of the sensors.
- Please refer to section 5.4 (Sensor setting Tip) in case you need to replace UV / MG/ IR sensor (if equipped) and to troubleshoot if any of the sensor is not working properly.




**< Sensor's position>**

## 7.1. Error caused by Sensor's breakdown and malfunction

| No | Error Code | cause | solution |
|---|---|---|---|
| 1 | **FEEDING ERROR A** | Error caused by delivery delay in A part | **I.** Please adjust defective parts after checking Roller around Main motor or Roller at feeder.<br>**II.** Please replace defective sensor after checking condition of Count Sensor A and B |
| 2 | **FEEDING ERROR B** | Error caused by delivery delay in B part | **I.** Please adjust defective part after checking Discrimination Part Roller<br>**II.** Please replace defective sensor after checking condition of Count Sensor B and C |
| 3 | **FEEDING ERROR C** | Error caused by delivery delay in C part | **I.** Please adjust defective part after checking Transfer plate Part Roller<br>**II.** Please replace defective sensor after checking condition of Count Sensor C and D |
| 4 | **SENSOR JAM A** | Count Sensor A's jamming<br>Sensor breakdown | **I.** Clean Count Sensor A<br>**II.** Please replace defective sensor after checking condition of Count Sensor A |
| 5 | **SENSOR JAM B** | Count Sensor B's jamming<br>Sensor breakdown | **I.** Clean Count Sensor B<br>**II.** Please replace defective sensor after checking condition of Count Sensor B |
| 6 | **SENSOR JAM C** | Count Sensor C's jamming<br>Sensor breakdown | **I.** Clean Count Sensor C<br>**II.** Please replace defective sensor after checking condition of Count sensor C |
| 7 | **SENSOR JAM D** | Count Sensor D's jamming<br>Sensor breakdown | **I.** Clean Count Sensor D<br>**II.** Please replace defective sensor after checking condition of Count Sensor D |
| 8 | **STACKER ERROR** | Stacker Sensor's jamming | **I.** Clean Stacker Sensor<br>**II.** Please replace defective sensor after |

| | | | |
|---|---|---|---|
| | | Sensor breakdown | checking condition of Stacker Sensor |
| **9** | **REJECT ERROR** | Reject Sensor's jamming | **I.** Clean Reject Sensor<br>**II.** Please defective sensor after checking condition of Reject sensor |
| | | Sensor breakdown | |

## 7.2 Error caused by Discrimination component

(Your model may not be equipped with optional FL or IR sensor or transmit image sensor)

| No | Error Code | cause | solution |
|---|---|---|---|
| **10** | **CF-A ERROR** | To show possibility of counterfeit on UV/ FL sensor | **I.** Clean UV sensor<br>**II.** Check UV Top sensor FL setting<br>**III.** Replace defective sensor after checking condition of UV sensor |
| **11** | **CF-B ERROR** | To show possibility of counterfeit on UV RL sensor | **I.** Clean V sensor<br>**II.** Check UV Top sensor RL setting<br>**III.** Replace defective sensor after checking condition of UV sensor |
| **12** | **CF-C ERROR** | To show possibility of counterfeit on MG Center sensor | **I.** Clean Brush roller ass'y<br>**II.** Check MG Center setting<br>**III.** Replace defective sensor after checking condition of MG Center sensor |
| **13** | **CF-D ERROR** | To show possibility of counterfeit on MG Left, Right Sensor | **I.** Clean Brush roller ass'y<br>**II.** Check MG Left, Right setting<br>**III.** Replace defective sensor after checking condition of MG Left, Right sensor |
| **14** | **CF-E ERROR** | To show possibility of counterfeit on IR Sensor(IRA) | **I.** Adjustment of image sensor setup after checking image quality<br>**II.** Check IRA setting |
| **15** | **CF-F ERROR** | To show possibility of counterfeit on IR Sensor(IRS) | **I.** Adjustment of transmit image sensor setup after checking image quality<br>**II.** Check IRS setting |
| **16** | **CF-G ERROR** | To show possibility of counterfeit on IR Sensor(IRH) | **I.** Adjustment of transmit image sensor setup after checking image quality<br>**II.** Check IRH setting |
| **17** | **CF-H ERROR** | To show possibility of counterfeit on IR Sensor (water mark detection) | **I.** Adjustment of transmit image sensor setup after checking image quality |